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Ventilated Cooling Apparatus.

Some country houses are so fortunately situated as to have conveniently at hand a never-failing spring, a stream from which, conducted through a proper building, cools the atmosphere and preserves milk, butter, meats, vegetables, and fruits in a fresh condition. The ordinary ice refrigerator in other cases supplies this want, but as ventilation—a continual circulation of air—is not always assured, it is not, under all circumstances, so good.

The apparatus shown in the annexed engravings is intended as a substitute for the spring house, and insures a constant passage of water-cooled air through the receptacle. Fig. 1 shows a box or receptacle intended to receive beer and ale in places where they are kept for use or sale. The receptacle may be of any required size. A tank, A, seen in Figs. 1, 2, and 3, holds a supply of water which is allowed slowly to drop or run through a faucet at the end into a shallow reservoir—B, Fig. 2—from whence it passes to a water grate seen in perspective at, C, Fig. 3, which is placed directly under the tank, A. From the bars of this grate depend sheets of ordinary gauze in light frames—D, Figs. 1 and 2—which are kept saturated by the water that drips from the grate and falls into the lower tank, E, from whence it is pumped up again by the hand pump, F. The cool air enters through the pipe G, Fig. 1, and passes in the direction of the arrows through the wet gauze, where it is cooled, through the receptacle, and out of the escape pipe, H, Figs. 1 and 3 in the latter case into the chimney.

Fig. 1.

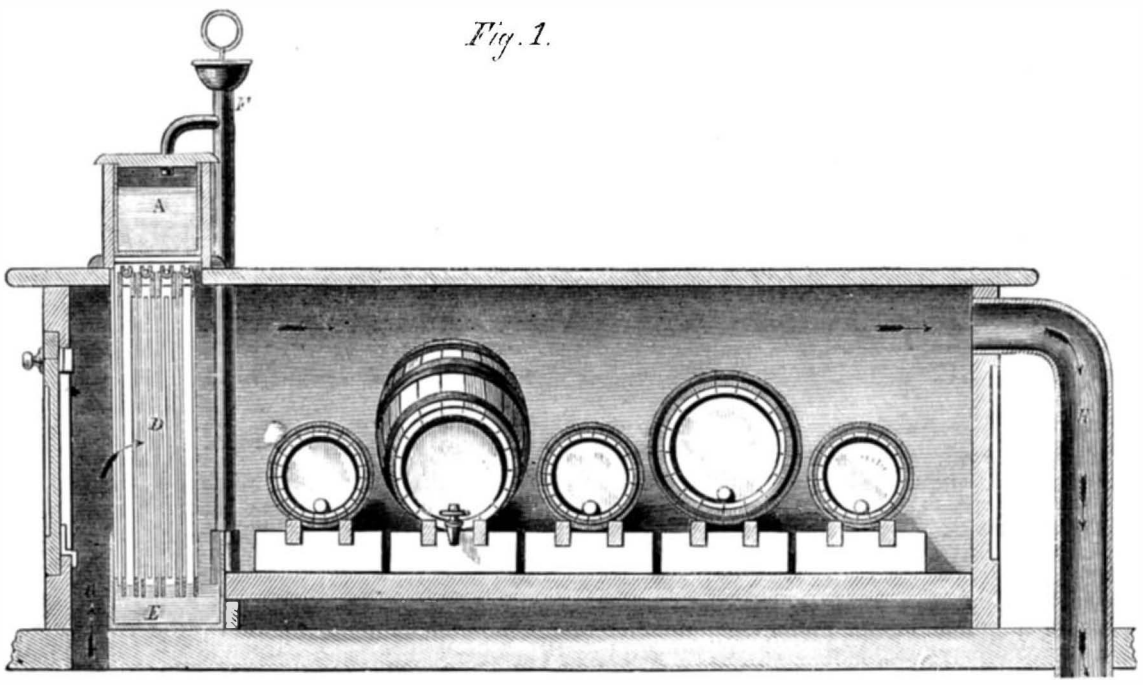


Fig. 2.

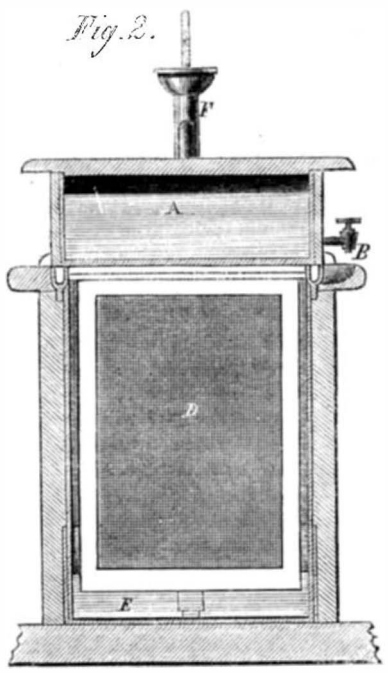


Fig. 3.

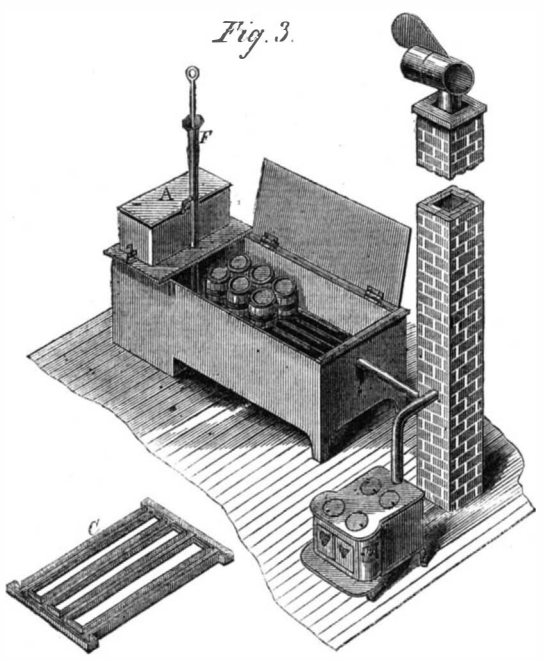


Fig. 3 more particularly represents an adaptation of this device to the dairy or buttery. It is readily understood without further explanation. It is not difficult to comprehend that articles of food can be in this manner preserved in hot weather without contracting any of that close, musty, and disagreable flavor which is detected often in those kept in the ordinary ice chest. For milk from which butter is to be made, especially, this apparatus would seem to be well adapted. It can in this be kept pure for a sufficiently long time to allow all the cream to rise without being tainted with sourness.

This contrivance was patented through the Scientific American Patent Agency May 29, 1866, by Frederick Villard of Canton, Ohio.

VILLARD'S ROTATING CHIMNEY CAP.

The object of this is a cheap, strong, and sightly ventilator for a chimney top to secure a good draft at all times. Fig. 1 is a sectional elevation and Fig. 2 a cross section at the top of the chimney. The flat, square top, A, is secured to the brick work by long bolts, B, held by clamps C, at the bottom ends. The circle inside the square has an inward projecting lip which receives the ring of the revolving part D. This arrangement prevents the upper portion or bonnet from being displaced by the wind. From the movable ring rise three arms holding a long central socket, E, in which a spindle turns and receives the whole weight of the cap. A vane keeps the funnel opening always facing the wind, which being contracted in volume as it passes through, creates a very strong draft. In Fig. 3 of the preceeding description the cap is seen in perspective affixed to a chimney top. This invention was patented through the Scientific American Patent Agency, March 5, 1867, also by F. Villard, who will reply to all communications addressed to him, relative to the Air Cooler or Chimney Cap, care of J. Abbott, box 69, Canton, Ohio.

VILLARD'S SUBSTITUTE SPRING HOUSE.

Fig. 1.

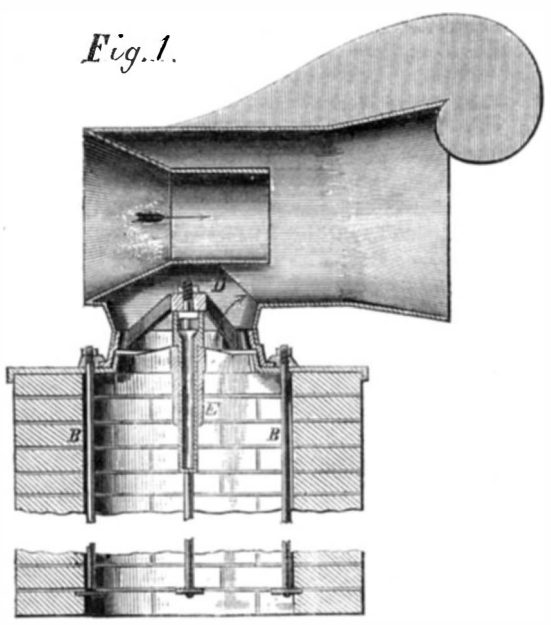
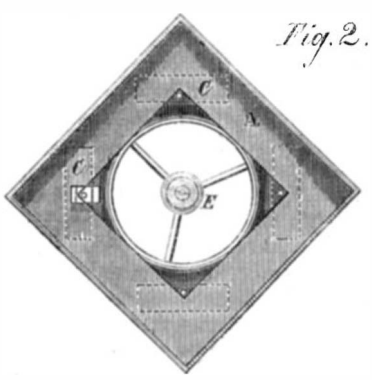


Fig. 2.



The Amazon.

There is a little colony of Englishmen settled at Iquetos, on the Amazon, 3,500 miles from its mouth. William Clark, an English (or is he a Scotch?) engineer, who once worked at Penn's, and who was for some years the chief engineer of the Peruvtan Government, organized an exploring expedition, two or three years ago, to the upper waters of the great river, and is now resident with his companions at Iquitos, in the Peruvian territory. He took out two steamers, boats, machinery, etc., and was accompanied by fifty volunteer soldiers, and by a number of British workmen and their families. The settlement is nearly as far off and is as romantic as was Robinson Crusoe's. There are plenty of cannibals (?) near, and some twenty-five of these rascals were shot in a single day's adventure. Mr. Clark has a foundery and engineering works, and has built and launched a floating dock for the repair of his vessels. From his letters, the upper Amazon appears to be a magnificent country, promising a splendid future. His steamers run regularly down the Amazon, and keep him and his colony well supplied with whatever they require from the outer world. Mills and machinery are already in demand in the neighborhood. Mr. Clark receives his *Engineering* with tolerable regularity. The last time we had the pleasure of seeing him it was in company with poor Holliday, formerly Penn's out-door engineer, and who, while chief engineer of the Ross Winans cigar ship, was lost one night in the Thames, when returning to his ship from Northfleet. Mr. Clark is likely to make a name in Peru.—*Engineering.*

EDITORIAL CORRESPONDENCE.

Ancient and Modern Paris—The Napoleon Family—The Exhibition—The Czar and King William—The Great Review—The Attempted Assassination.

PARIS, June 8, 1867.

I suppose that no other city of ancient or modern times has undergone so many changes as Paris during a period of ten years. The Paris of history is passing away and a new city full of wonders and beauties is rapidly coming in. Twenty years ago Louis Napoleon was tried as a conspirator and condemned to death. Louis Philippe commuted the death sentence to perpetual imprisonment in the fortress of Ham, whence the convict escaped, as is supposed, through the friendly contrivance of his physician. In 1848 Louis Napoleon was the ruler of France, and Louis Philippe became an outcast and a fugitive from his throne and country. In the meantime France has made rapid strides in all that constitutes a great and powerful nation. Her commerce is widely extended, her manufactures are flourishing, and to all appearance the people are happy and contented. There is, however, a great diversity of opinion about the personal popularity of the Emperor; yet I think, on the whole, that he satisfies the people. It is generally admitted that his fillibustering expedition to Mexico was an unwise and foolish scheme, and I am certain that the people rejoice at its failure. This constitutes one element that has somewhat impaired the faith of the French in the shrewdness of their Emperor. It also shows the practical value of the sympathy of the United States when extended to a struggling people whose liberties and rights were sought to be usurped by a foreign despot.

I remarked that the Paris of ancient time was rapidly passing away. If the visitor goes to the cathedral of St. Denis, he will find that revolutions have despoiled that place of many of its rarest objects of interest, and instead of the tombs of the ancient kings he will be shown the place where their remains were thrown into one common trench. If you visit the splendid Pantheon church, it is true you will find the monuments of Voltaire and Rousseau, but the remains

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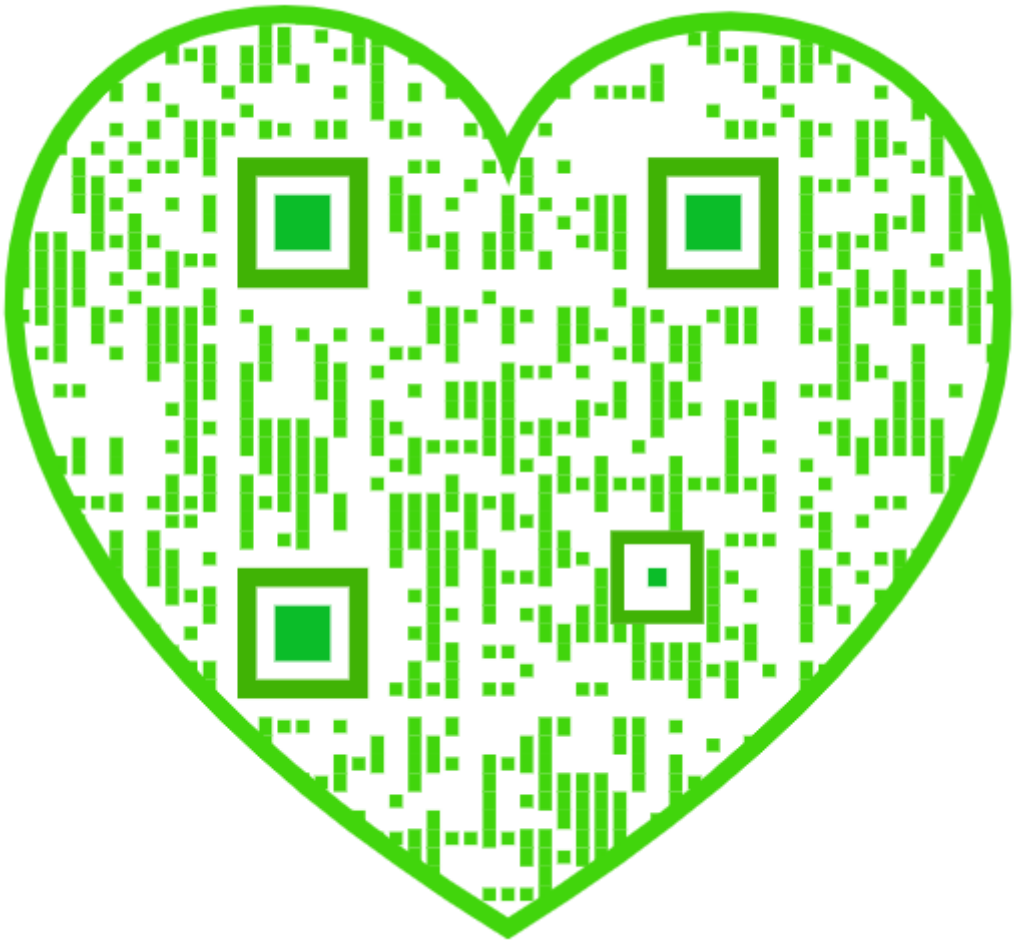

have been carried away, and the body of the bloody Marat, once entombed in this church, was exhumed, and in a freak of passion thrown into a sewer. These events occurred years ago, but they serve to verify the declaration I have made about ancient Paris. Architecturally the city is rapidly changing its character by the opening of broad boulevards, and the necessary destruction of those old streets and houses where revolutions have kindled their fiercest fires. This wholesale demolition has turned thousands of people out of their old homes, and they have been compelled to seek new ones and to separate from associations which had become tender to them by the lapse of time. This also has created a feeling against the Emperor, as he is charged with the responsibility of all these innovations, but no one can fail to see that these changes are making for Paris an interest which relics and ruins of ancient time could never accomplish.

There is, however, but one Paris. It is the capital of Europe, and seems to lie in everybody's way; for all the monarchs, from the time of Catharine de Medici to the present Emperor, have exhausted their genius and lavished their treasures to make it the great show-place of the world. Frenchmen throughout all France are proud of their capital and seem to regard it as the only proper residence for all mankind. There are no rival cities, as in the United States, to feel jealous of the growth of the metropolitan city. I do not regard the French as a very inventive people, but they have wonderful power of adaptation, the love of experiment, and the spirit of emulation and inquiry, and seem ready to adopt any improvements that will minister to the interests of strangers.

The more thoughtful French character contemplates the future of France not without some forebodings of evil; and some even declare that it may not be long before the Orleans family, in the person of the Count de Paris, may recover the rule of the nation. Louis Napoleon is growing old, and some say infirm. The little Prince Imperial is delicate, the Prince Napoleon is not very popular, and many profess to see in these manifestations of weakness signs of the approaching decay of the Napoleonic rule in France. I think, however, that those who rely upon the fulfillment of these signs will be disappointed. There is something in the name Napoleon which electrifies the people of France, and the great deeds of this family are so thoroughly traced upon all one sees, that it would require a greater revolution than has yet taken place, to erase them.

I think myself fortunate to be in Paris at this time. The Exhibition which was foreshadowed by the English press to be a failure, is, to my mind, one of the wonders of creation. The illustration of the building, recently published in the Scientific American, is one of the best I have seen.

I have thus far spent the best part of four days in attempting to see its objects of art and utility, and I can truly say that I have not seen the Exhibition, so vast is it, and as I shall leave Paris in a few days for a journey eastward through Prussia, Austria, and Switzerland, I reserve my impressions of it, possibly till some other time. I met an American the other day who has made forty visits to the Exhibition, and who declared that his interest was still unabated. I think what one can see in the various buildings outside the Grand Palace of Industry, such things as indicate the manners, trades, and customs of the older and ruder nations of the world, are full of marvellous interest. But Paris is interesting now from the fact that in all probability there are upwards of a half million strangers now in the city, and also from the fact that it contains two Emperors, a King and the Crown Prince of the three most powerful nations on the continent—Napoleon, Alexander the Czar of Russia, and King William of Prussia—and Prime Minister Count Bismarck, a man more feared in Europe than any of the crowned heads. *Charivari*, the *Punch* of Paris, facetiously announces the "arrival of Bismarck and his servant King William."

Napoleon has extended to his royal visitors a most marked and to all appearance a most cordial welcome. Balls, operas, reviews, and other exhibitions are constantly prepared for their entertainment, and the whole city is alive with excitement. Apart from the great influx of strangers, it is a mystery to me how so many French people can afford to idle about these displays of pageantry. The review at Long Champs on the 6th was perhaps the most brilliant that has ever occurred. At an early hour in the morning carriages and pedestrians were pressing their way by thousands toward the Park, expecting to gain eligible positions to witness the display. Having fortunately secured seats in the tribune, we did not depart from Paris until noon, which was two hours before the review. So great was the rush, however, we did not get to our position until half-past one. The police of Paris are much more skillful in managing a crowd than ours in New York. Had it been otherwise we could not have gained the places assigned to our party. There were sixty thousand troops, "horse, foot, and dragoons," drawn along in lines around a vast parallelogram, the whole being visible from the position we occupied. At the precise hour a flourish of trumpets announced the arrival of the reviewing party, which was composed of the grandees of Europe. The two Emperors and the King rode side by side at the front and were followed immediately by their suites—all mounted upon fine horses and dressed in brilliant costumes. Having passed around the entire inner line of troops, which occupied about three quarters of an hour, the reviewing party rode across the field and took a station immediately facing the tribune. Then commenced the movement of the entire military force, infantry, artillery and cavalry—passing immediately in front of the Emperors and King. The marching of the infantry, the rattling of the artillery, the grand charge of the cavalry, and the inspiring strains of the numerous bands of music, together with the brilliant uniforms of officers and men, produced a scene which those who witnessed it will never forget, and one that is not likely to occur again in Europe. The attempt made by a desperate young Pole—Berezowski—to take the life of the Czar as he rode away from the review, produced a most intense excitement, and before we were aware of what had happened we found ourselves surrounded and hemmed in by an agitated crowd who were pressing the officers as they attempted to to carry away the would-be assassin. It took us nearly an hour to get out of the confusion. The escape of the Czar was the subject of general joy, and the Parisians were especially thankful that the attempt was not made by a French subject. S. H. W.

Special correspondence of the Scientific American.

MACHINE TOOLS AT THE EXPOSITION.

Paris, June 4, 1867.

STEAM HAMMER.

A tool which from its novelty attracts considerable attention, is Davies' steam striker, designed to imitate as clearly as possible the action of a sledge, and to be able to strike a blow in any direction, so as to be applicable to work of irregular shape, or to forgings which are too unwieldy to be got under an ordinary steam hammer. The form of hammer head is retained as in a blacksmith's sledge, and this is carried at the end of a stout wrought iron arm working on a pin, the other end being in connection with a steam piston. The whole of the working parts are placed in a cast iron ring or cylinder, which may be revolved within a fixed casing so as to bring the plane of motion of the hammer in any direction, and the only provision that has to be made for the rotation, therefore, is that of a stuffing box around the steam pipe where it enters the inner casing. The valve gear is made self-acting by the impact of the hammer, and the force and time of the blow is regulated by a lever at the anvil which the blacksmith works with his foot. The whole machine is mounted on the top of a hydraulic ram, by which it can be raised or lowered a certain distance, or be turned around to work on a number of anvils placed in a circle about it. This tool is made and has been a good deal used at the Viaduct Works, Crumlin.

MINING MACHINE TOOLS.

A very simple tool for coal mining is exhibited by Messrs. Jones & Levick of Blaina. A flat pick is carried on a vertical shaft so as to work horizontally. The bearings of this shaft are cast on a ring arranged to revolve as in the steam striker, so as to bring the plane of motion of the pick in coincidence with that of the coal stratum. A horizontal cylinder placed concentrically with this ring is employed to work the pick; compressed air being used for the purpose. The valve gear is self acting and appears to be quite simple. The whole is mounted on wheels suitable for a railway, and the hight is not more than two feet.

By the side of this stands the rock-tunneling machine of Capt. Beaumont of the Royal Engineers, also driven by compressed air. It consists of a heavy circular head, carrying at its circumference as many as fifty drills, and receiving motion forward and back from the air piston, to the rod of which it is attached. A slow rotary motion is also given to the head by frictional parts operated by the motion of the piston, so that a circular rift is made in the rock as the drilling advances. A single drill is placed at the centre of the head, and the hole bored by this is used for the blasting charge necessary to remove the circular block.

Passing this, we come to a simple pump which throws an immense stream of water. It is merely a common chain pump with india rubber disks for the buckets, and these fitting the barrel tightly, yet without great friction, enable a good duty to be done without waste of power.

BRICKS AND BRICK MACHINES.

A large brick machine, or rather a series of machines, for this manufacture is next in order, and this is generally in operation. A great deal of attention has of late years been given in England to this class of machines, and a number of different forms are produced. As a rule, the ordinary bricks used in that country are of the most miserable kind, possessing neither strength nor comeliness, but good bricks are produced there. Many of the better class used for houses are made with holes passing through them, and these, if properly laid, are said to be much less subject to dampness than the solid ones, as the air has access to them more freely and tends to carry away the moisture. In Paris this form of brick seems to be exclusively used. In the American department, a model of a brick machine from Philadelphia is exhibited, and a full size machine is at work not far from the exhibition. It appears very ingenious in its construction, and is capable, according to the statement of the exhibitor, of making 35,000 to 40,000 bricks per day of ten hours.

WOOD-WORKING MACHINERY.

One of the best portions of the English department is that devoted to wood-working machinery, of which a very great variety is exhibited. This class of machines is one, as everybody knows, to which great attention has been paid in America, and it is there that most of the designs have originated. The English, however, in copying them, have not done so blindly, and the visitor will find that not only are these tools constructed with far greater perfection of workmanship than with us, but that many improvements have been made in the design of tools, besides the addition of some that are not in use in America. Most of these tools are in operation, and I notice that they are not afraid to give a high speed to the cutters, which will be acknowledged to be one important point in wood-working. To do this and at the same time have a durable machine, they claim that the bearings must be of ample dimensions and be fitted with nicety, and indeed the appearance of these tools is scarcely inferior to those designed for working in metals. One of the best, simplest and commonest tools is the band saw, and for some singular reason this is hardly ever used in America. It consists merely of an endless saw passing over two pulleys, one above the other, by which it is kept in tension and driven. One pulley is made adjustable so as to regulate the amount of tension, and is furnished either with a spring or a counterweight to allow of the expansion and contraction that necessarily occur from the heating and cooling of the saw when in use, without either causing the band to become loose and slip, or to snap from over-tension. The advantages of this tool are most obvious: as the motion is always in the cutting direction no time is lost in reciprocations, and for the same reason much more delicate work can be done with it, as there is no alteration of strain which would tend to break thin portions of wood, and, moreover, a fan is rendered unnecessary, as all the saw dust is carried down beneath the table. The pulleys generally have leather coating for the saw band to run on, though this is not always the case. The English are certainly ahead of us on this tool, for if, as I have heard it said, we have not been able to make it go, they have, and there is no shop of any consequence without it.

A good tool among those exhibited is a cross-cut circular saw for cutting off stuff to a gage, in which the saw moves up to the work instead of having to move the gage. This is very simply effected by placing the saw arbor with its pulley shaft placed below, so that as the upper end is moved forward or back, the length of the belt connecting the two is not affected and the small rise and fall in the position of the saw is of no consequence. This is made to move automatically by reducing gearing from the shafting, and in such a way as to give a quick return motion to the saw; but it would of course be equally possible to bring the saw up by a hand lever if desired, which would somewhat simplify the machine, though it cannot be called at all complicated.

In another machine the end of a circular saw arbor carries a slotting drill for mortising, acting on the same principle as those now so generally used for metal-working. The drill of course remains stationary, and the table on which the work is placed is moved back and forth by hand before it. This tool does its work very quickly and well, and only requires a second operation to square out the ends of the mortise, which is of course easily done under any of the ordinary tools for that purpose.

A tenoning machine capable of working at any angle is also shown. Two arbors, one above the other, with overhung tool heads, carry the cutters, and the work is traversed between them by a table with a gage by which the desired angle may be given to the plank.

Another good machine is one for planing at one operation the sides and edges of a piece of stuff. The arbors are made stout and of good length, and this allows the tool heads to be overhung without injury to the stability of the machine. The heads are forged solid with the arbors, but have a hole bored out of the centre of them which reduces their weight materially. The feed is driven by a friction gear, bearing against the face of a large disk, and this arrangement enables the speed to be varied while the machine is in operation, instead of making it necessary to shift the belt, as in some tools. For this purpose a screw is provided, by turning which the friction gear is brought nearer to the centre of the disk and so receives a slower motion from it. In this way the speed may be easily reduced from 25 ft. to 10 ft., when the workman sees a loose knot or anything that would endanger his cutters. This may also be used for tonguing and grooving staves for circular work. The arbors of the two tool heads working on the edges of the stuff are made so that they may be set at any angle, according to the width of the stave or the diameter of the cylinder of which it is to form a part, and the two are necessarily inclined at the same angle. Into the iron table of this machine, directly under the cutters for planing the upper side of the stuff, is dovetailed a piece of hard wood, its upper surface, being slightly rounded and rising by the amount of its curvature above the general face of the table.

A machine for cutting moldings either straight or curved, presents, I believe, no special feature not already familiar in America. It has a vertical arbor with a small head and cutter, so as to enable it to work on curves of short radii, and the work is traversed before it on a suitable table.

Slade.

THE ALLEN-PORTER-WHITWORTH HIGH-SPEED ENGINE.

Paris, June 11, 1867.

In one of my earlier letters I alluded to the Allen engine now at work in the Exposition, and promised to give a more detailed description of it at some future time. I will now redeem that promise and endeavor to explain the principles on which it is constructed. The distinctive feature which gives it its name is the arrangement of the valve gear for advantageous expansive working, the invention of a well known New York machinist of that name. Mr. Chas. T. Porter, who has undertaken to introduce it in England, has however combined in the engine a number of qualities which together tend to make a machine of unusual excellence. The first object that has been sought has been to produce an engine adapted to a high speed, and as the valve gear is a positive and not a detaching one it is particularly suited for this purpose. The advantages of high speed theoretically considered are quite obvious, since weight, space, and cost are all saved by setting a small engine working rapidly to do the work of a large one moving slowly. The difficulty however has been to produce an engine in which it was possible to maintain a high speed without a destructive wear and tear of the parts. A high speed engine must have no rattle traps about it, must have ample bearings and wearing surfaces, and all its adjustments must be such as to have no slack, though without the intro-

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duction of any superfluous keys or adjusting pieces which may either work loose or put it in the engineer's power to spoil his engine. These points and others which will appear as we proceed, have been kept carefully in mind in the design of this engine. First, in reference to the valve gear. It is well known by all familiar with the subject, that the use of a single slide valve to accomplish the admission, suppression and release of the steam to and from the cylinder is only possible when we are willing to sacrifice something of the peculiar characteristics which we should wish each of these elements of the distribution to have. In all engines therefore in which a correct distribution is sought ,the attempt to make a single valve accomplish so many different functions is abandoned, and in most cases, as in the Corliss, Sickles and other arrangements, four separate valves are set to admit and release the steam. This is the plan also which is adopted in the Allen engine, although as both exhaust valves are worked by a single stem, we might perhaps regard them as but a single valve in effect. A single eccentric moves all the valves, but the motion imparted to them is modified by interposing between each steam valve, eccentric rod and its valve stem, a bell crank rock shaft. The cut-off is varied by the govern or raising or lowering the ends of the rods which we have called the eccentric rods, in a curved slot or link formed in the eccentric strap itself, and in order that each steam valve may have exactly the motion required for its own functions, these rods, though starting from the same block, are made separate and of different lengths. This enables the following condition, which is the gist of the whole, to be obtained. Each bell-crank rock shaft is so placed that when the eccentric is at its full throw in the direction of opening its valve, the arm towards the eccentric is nearly on its center, or in line with the eccentric rod, while the arm connected to the valve stem is nearly vertical, or at right angles to the rod. By this means, it will be seen, a very slight motion of the eccentric produces a very rapid motion of the valve, while, when the eccentric is at the other extremity of its throw, the relative position of the arms of the bell crank being reversed, a very considerable movement of the eccentric produces but little motion in the valve. In other words it remains nearly at rest when closed until the time comes for it to admit the steam, when it rapidly opens a wide port and as rapidly closes it again. The exhaust valve receives a constant motion from the end of the link. The steam valves are placed in a separate chamber from the exhaust, the latter being situated beneath the former. There is a rather large amount of port space involved in this arrangement, but every care is taken to reduce it to a minimum. Equilibrium valves are used for the admission, constructed on a very simple and beautiful principle. The valve is a rectangular frame, like the four sides of a box without top or bottom. Over the back of this is a fixed plate which receives the pressure of the steam and under which the valve just freely slides. This plate is recessed on its under side, and its edges and those of the valve and seat are so situated that when the valve begins to uncover the port it also opens an equal space at each of its sides, top and bottom, thus giving in effect a port four times the length of the valve. The exhaust valve is also constructed so as to open twice its own length of port. The engine at work in the Exposition is running at 200 revolutions per minute, and the diagrams taken from it show a quick and free admission of the steam, giving an initial pressure but little below that in the steam chest (to which an indicator is also applied); a sharp cut-off, an early release, and complete escape of the steam before the returning piston, leaving but half a pound difference of pressure between the cylinder and condenser as measured by the same indicator, and lastly a small amount of compression just sufficient to ease the motion of the reciprocating parts.

The condenser is a part of the engine on which considerable thought has been bestowed. The condensing chamber and hot well, which are side by side, form the upper part of a square casting of which the lower portion is a water chamber forming the air pump. Into this works horizontally a pointed plunger keyed to a prolongation of the piston rod, which by its displacement draws in and forces out a certain quantity of water at each alternate stroke of the piston. The movement of the water produced by this means is as gentle as could be wished at this speed, since it only rises one inch at each stroke and escapes freely at the delivery valves in the bottom of the hot well. The foot valves of the condenser are on the same level as the delivery valves, and open downwards, so that the air entering the air-pump chamber from the condenser remains on the surface of the water and is the first to pass out at the delivery valves, the top of the chamber being slightly inclined to facilitate its escape. This is a very important point, and the proof of it is to be found in the fact that the vacuum obtained remains constantly at 27¼ inches to 27½ inches. To particularize all the points in which the mechanical construction of the engine has been adapted to high speed, would occupy too much of your space. But so carefully has this been done that many who at the first glance exclaimed that such a speed was necessarily too much for any engine, have after a more careful examination of it, confessed that the conclusion was irresistible that an engine could be designed as suitable for that as for a lower speed. In every part the designer has studied to have as few loose pieces as possible. Thus his piston is shrunk on to the rod and held firmly by that means alone. In the smaller sizes the packing consists merely of small grooves turned in the face of the piston, the action of which in preventing the flow of gases is well understood. In the larger engines Ramsbottom's rings are employed, which render all springs or other means of adjustment unnecessary. The crank-pin brass in the connecting rod is held in the solid end of the latter, in which is a wedge of a large bevel, and held by a single good bolt at the top of the rod, and another at the bottom, by means of which it can be set and firmly held at any position, the two bolts locking each other through the intervention of the wedge acting as a deep nut. Great care has also been used in the design of the crosshead to secure lightness, strength, and ample and hard surfaces. The pin is surrounded by a bush of hardened steel, with a square formed on its ends by means of which it is let into the body of the crosshead and prevented from turning. The thorough lubrication of all the parts is another vital point, and has been amply provided for, constant lubrication being in all cases adopted; in the cylinder and valve chest by Ramsbottom's "displacement lubricator" and in other parts by suitable oil cups and wicks. The economy of oil by such means in proportion to the useful effect produced, is sufficiently evident to secure more general attention to its use. I have given this full description of this engine because it unites in itself more features of correct engineering than any other in the Exposition, and moreover being entirely American in design, though English in construction, it is something in which we may take some pride, the more so as the contents of the space allotted to us are not quite such as we should like to have had here to represent the skill of our inventors and machinists. SLADE.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Velocity of Steam.

MESSRS EDITORS—In the SCIENTIFIC AMERICAN of June 8, 1867, on page 359 is the following paragraph:—"Velocity of Steam and other Gases.—Mr. R. D. Napier has demonstrated to his own satisfaction and that of others, first theoretically and afterwards by experiment, that the velocity at which steam will flow from a boiler through an orifice into a vacuum is rather less than half of that given in all published tables, and that it is no greater into a perfect or partial vacuum (at a pressure of two or more atmospheres) than into the air.—the general law is established, that a gas of any given pressure will rush into a gas of not more than half that at the same rate as into a vacuum."

There is an error in this paragraph, either on the part of Mr. Napier or his reporter. It is true that steam flows into a vacuum at only half "the rate" (or half the quantity in a given time) that is given in the published tables; not however because its velocity is less than the old theory assigns to it but because its density is reduced one half in passing the orifice. With this modification the views of Mr Napier as given in the paragraph are correct.

It would be a mistake however, to suppose that Mr. Napier was the first to advance these views. The same views were fully set forth and demonstrated theoretically in an article published in 1848 in the *American Journal of Science and Arts*, second series, Vol. 5, page 78; and the general law of the flow of elastic fluids which is there established theoretically, was afterwards shown to be in almost exact accordance with the results of experiment in another article published in the same work in 1851, Vol. 12, page 186. W.

FACTS ABOUT EXPLOSIONS OF STEAM BOILERS.

If the causes of boiler explosions are ever ascertained so that they may be prevented or at least their destructive effects reduced, the facts and circumstances attending their occurrences must be recorded. For this reason we make room for two communications, the facts contained in which are somewhat commented upon.

MESSRS. EDITORS:—I have perused with much interest your articles on steam boilers, and their explosions, to see if I would find a case of explosion similar to one I once witnessed. The boiler explosion I refer to was in a saw mill belonging to my father in the interior of this state and occurred several years since—in 1857 I believe. There were two 30 in. cylinder boilers, 30 ft. long, enclosed in the usual manner by brick walls. The mill had been running until about 11 o'clock when the engine had been stopped for about ten minutes to sharpen the saw. Steam was blowing off at 60 lbs., making considerable noise, as the safety valve was not inclosed by an escape pipe, when the person in charge of the mill ordered the fireman to hang an old stirup lying by on the beam. It had not been there more than three minutes when the explosion took place. Both boilers exploded simultaneously, with a report like artillery; it was but a single instantaneous report. One boiler parted about 8 ft. from the front end in the middle of a sound sheet, or an apparently sound one, both ends flying apart, that is neither end flying sideways. The other boiler was torn like wet paper, completely to pieces, or at least in 19 separate pieces, some of them torn across the joint or lap of the sheets, some flattened out nearly straight, others doubled up, but neither head of either boiler, which were of cast iron, was broken or separated from the sheet to which it was fastened. The large or longest end of the first boiler described was blown through the brick chimney, 7 ft. square at the base, from thence taking out all the side posts on one side of a blacksmith shop about 20 yards off, then striking ground a little more elevated ploughing a furrow, its depth of diameter, about 130 yards and there stopping.

I cannot understand how steam, if steam it was, can tear a boiler almost to atoms. I have seen several explosions but none in which such fearful power was shown. The boilers contained sufficient water which was rather strongly impregnated with lime. The boilers were placed at right angles with the mill and about at the centre of the building, outside in a separate boiler house; so placed to guard against danger and destruction in case of explosion, it being supposed that the boilers would almost certainly fly sideways out of their bed. Is that supposition right, generally?

I am using now in a horizontal tubular boiler, water very strongly impregnated with sulphur; will that sulphur injure the iron or how will it affect it? My boiler primes badly; will carrying my steam pipe from the dome on the side from the engine, down the side of the boiler, and under the grate bars, thence upward as high as the dome and to the engine, infringe on anyone's patent for superheating steam, and will it not accomplish the object? W. B. VAN VALKENBURG.

St. Mary's, Ga.

This is undoubtedly a case of genuine explosion, some of the characteristics of which are an entire destruction of a boiler, the ruptures generally taking place in the strongest parts of the boiler, or, in other words, not in the parts where it was riveted, but through the solid sheets.

It is here proper to say that by actual experiment it is found that a single riveted joint loses 44 per cent. of the strength of a plate not riveted.

Now it seems one boiler was torn through a solid sheet and not in the line of rivets. If the rupture had been caused by a gradual accumulation of pressure it would undoubtedly have given way in the weakest part along the line of rivets, being there but about half the strength of the solid plate. The other boiler, its mate, it seems was thrown into a large number of pieces—rents at random—and all with the safety valve open!

The inevitable conclusion is that there must have been an instantaneous increase of pressure, so instantaneous as not to give the safety valve time to open more to relieve the boilers; in fact the entire destruction of one boiler was not sufficient relief to save the other!

The direction that the two pieces of the boiler took was that due to the force that propelled them. Under the circumstances the boilers could not have gone sideways. Had a rupture taken place on the side, the boilers would have been propelled in the opposite direction; if on the bottom the boiler would have gone up.

This is a very rare case. A prominent engineer with an experience of over 40 years with steam boilers has seen but three cases of the kind; the cause for these terrific explosions is not yet understood.

The sulphur in your water will, without doubt, cause your boiler to prime. You will be relieved of your priming by suspending a platform of wood or metal, at the water line directly under the point where your steam is taken off. Let it be of sufficient size (square) to fill the space at the water line. You will cool rather than superheat your steam by the method you propose of conducting your steam down the side of the boiler and under the grate bars.

MESSRS. EDITORS:—Your correspondent G. W. D., of Providence, R. I, was not correct in the statement of the cause of the boiler explosion that lately took place in Massachusetts, as given in your paper No. 23, Vol. XVI, page 358. The superintendent has never attributed the cause to an excess of water or yet to any known cause. The boilers were plain cylinder boilers, 36 ft. long 30 in. diameter, and carrying the usual amount of steam at the time of the explosion—"about 80 lbs." They were fed at the rear end, water being pumped through a tank into them, the pipes so arranged that the check valves could hardly be said to be nearer one boiler than another; the boilers were placed in two sections, four in each. The coal used was pea and dust mixed, consequently the fires had to be cleaned out at least once a day. At the time of the explosion the fires were about to be cleaned, having some six or eight inches of dead ashes on the grate bars, with two or three inches of fire on that, which was low in order to clean them out, usually done by pushing back the fire to the bridge wall, then drawing out the ashes, pulling the fire down on the grate bars, and adding fresh coal. Just before cleaning the boilers were always filled with water. The fireman had just stopped the pump as the agent of the mill came into the room, and trying the gages of each boiler himself and finding a full gage at the upper cock, he cautioned the firemen not to fill the boilers too full as he thought it not good economy in making steam. He went directly to the office and had hardly seated himself when the explosion took place. One of the center boilers was broken about six feet from the end, or the length of two sheets from the head of the rear end, parting in the rivet holes. The short end of the boiler lodged in the chimney, the other was thrown some 800 feet from its bed, almost in a direct line; the one next to it was lifted up and thrown over the other two outside of the building. All of them seem to have been lifted up as from a pressure below; the walls were leveled even with the ground, scarcely one brick left upon another, and even below the ground the flues leading to the chimney were more or less shattered. The explosion took place at once upon stopping the blower. There was heard a sound as of a heavy rush of air, as described by those working in a building near by. One hearing this sound jumped from his chair and reached the centre of the room before hearing the report of the explosion.

Now, Messrs. Editors, what was the cause of the explosion? Was the space under the boilers charged with gas, a space perhaps, 20 ft. long, 3 ft. deep, and of the width of each section? Some have thought so. The fireman has since said his furnace doors have sometimes sprung open and the smell of gas was quite strong, particularly when the blower was being used, or the fires buried at night, at which time the damper was nearly closed. I think no argument would convince the agent of the mills that the cause was absence of water, after trying them himself. Could a boiler foam out its water in ten minutes, or less than that time, with such low fires as were burning at the time of the explosion?

Hebron Mills, Mass. C. T. CARPENTER.

[The above was probably not technically an explosion, but the giving out of the part under a gradually accumulated

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pressure. If all the facts were known, it undoubtedly would be found that the joint where it gave out was a forced one, or in other words, when the boiler was made, the parts did not fit, and were hammered cold to make the one larger and the other smaller, and then to make the rivet holes correspond; the drift pin was freely used—all tending to disintegrate, crack, and destroy the strength of the plates—a most vicious practice.

The supposition that gas externally had any thing to do with the rupture of the boiler, or the destruction caused by it, is absurd; the large quantity of water suddenly liberated at a temperature of over 315°, together with the explosion of the steam, which would be instantly made on liberating the pressure—to this add the steam contained in the boiler, which would expand about 4.7 times—and we need search no farther for the cause of the destruction, lifting boilers, etc.

With regard to the boiler "foaming out" its water in ten minutes. This would be impossible, and to keep the engine running, inasmuch as there was say 120 cubic feet of water in the boiler and to put that through the engine in ten minutes would probably knock it to pieces.

This occurrence will very naturally create a distrust of the remaining boilers. They should be tested by the hydraulic test to a pressure 30 per cent higher than the steam pressure required, and the steam gage should be examined to see if it is perfectly correct.—EDS. SCI. AM.

[For the Scientific American.]

THE SAMPSON SCALE.

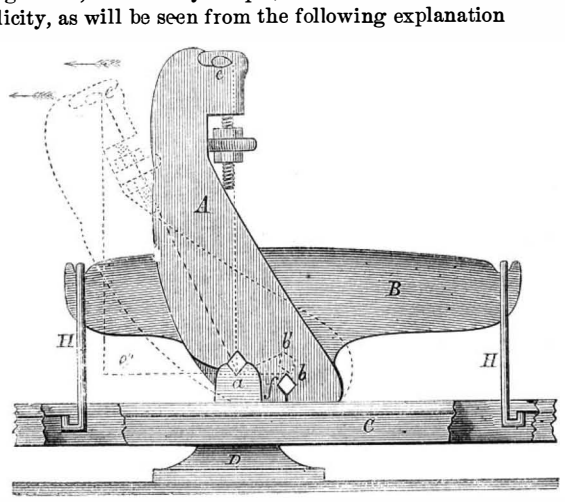
[Entered according to act of Congress, in the year 1867, by M. Richard Leverson, in the Clerk's office of the U. S. District Court for the Southern District of New York.]

A novel and interesting application of the mechanical laws of moments is to be seen in the Sampson Scale, in which the inventor, probably without knowing it, has afforded a beautiful illustration of those laws, and has produced a scale of unequaled delicacy and which(equal workmanship being assumed) not merely is, but demonstrably must be more sensitive than any platform scale yet invented.

Our readers will no doubt remember that the moment of a force with respect to a point is the product obtained by multiplying the intensity of the force by the perpendicular distance from the point or center of moments to the line of direction of the force. This perpendicular direction is called the lever arm of the force, and the moment itself measures the tendency of the force to produce rotation about the center of moments.

The moment of a force with respect to an axis of moments is equal to the moment of the projection of the force upon a plane at right angles to the axis taken with respect to the point in which this axis pierces the plane as a center of moments.

These are the only principles involved in the Sampson scale to which attention need be called, their application being novel, remarkably simple, and beautiful from their simplicity, as will be seen from the following explanation



The top yoke, B, carrying the frame or bottom yoke, C, hung from it by the links, H, rests upon a knife edge, *b*, between the ear-shaped connected arms or uprights, A, which rest by their knife edge, *a*, on D. A chain connects by another knife edge at *e*, and according to the capacity for which the scale is designed connects either by a bell crank directly with the short arm of the steelyard, or with that short arm through other levers constructed on the same principle with the first, until the desired multiple of the scale weight is obtained.

In a scale capable of weighing 20,000 pounds, the first lever was in the proportion of six to one, a second was in the proportion of three to one, and a third in the proportion of six to one, while the steelyard was in the proportion of a little more than six to one—so that three pounds at the extremity of the long-arm of the steelyard should balance 2,000 pounds upon the platform.

The platform rests upon four carriages, C, one at each corner of the floor. The weight W, resting upon the platform; it is obvious that *a* is an axis of moments, with respect to the weights, W, and with respect to the weight, P, which rests on the steelyard, and which two weights are in effect two forces tending to turn the rigid body, A, round the axis *a*, in opposite directions. The weight, P, is a force, P, applied in a horizontal direction at *e*, and the weight, W, is a force, W, applied in a vertical diretion at *b*, and it is by making the angle, *eab*, a right angle, that the extreme delicacy of the scale is secured, while the shortness of the lever arms, *ab*, *ae*, frees the scale from the *spring*, which is the chief source of error in almost all the ordinary descriptions of scale, absolutely unavoidable when a long lever arm is employed.

So long as the moments of P and W, with respect to the axis of moments, *a*, bear the same proportion to one another, so long is the utmost sensitiveness insured. When P and W are ballanced, $P \times ae = W \times ab$, but suppose $P \times ae$ is unequal to $W \times ab$, and let

$$\frac{P \times ae}{W \times ab} = Q \text{ be greater than 1,}$$

then P will pull the scale over (raising the weight, W,) into, say, the direction indicated by the dotted lines, *ae' ab'*.

The moment of the horizontal force, P, tending to revolve the body, A, about the axis, *a*, in one direction is $P \times e'e'' = P\ ae' \cos.\ ae'e'' = P\ ae \cos.\ eae'$, and the moment of W tending to revolve the body, A, in the opposite dirsotion about *a* is $= W \times af = W\ ab' \cos.\ b'af = W \times ab \cos.\ e'ae$ (*e'ab'* being a right angle and the angle *b'af* therefore equal to the angle *e'ae*.)

Then the ratio of the moments of P and W, when the body has been drawn to the position indicated by the dotted lines is

$$\frac{P \times ae \cos.\ eae'}{W \times ab \cos.\ eae'} = Q \text{ as before.}$$

But if the knife edges had been otherwise disposed these ratios would have varied with every change in position of the rigid body A.

Suppose the angle *e'ab'* or *eab* not to be a right angle, then the moment of P with respect to the axis, *a*, would have been $= P \times ae$, cos. of the angle which *ae* makes with the axis of *y*. Call this angle Y, and the moment of W with respect to the same axis, *a*, would be $W \times ab \times \cos$ of the angle which *ab* makes with the axis of *x*. Call this angle X, and the ratio will be

$$\frac{P\ ae \cos Y}{W\ ab \cos X}$$

Let the body A be drawn over say by P, as before. Then the angles made by the lever arms of P and W with the axes of *x* and *y* respectively are increased by the same quantity, *v*, and the moments of P and W become respectively $P \times ae \cos (Y+v)$ and $W\ ab \cos (X+v)$, but

$$\frac{P \times ae \cos (Y+v)}{W\ ab \cos (X+v)} \text{ is unequal to } \frac{P \times ae \cos Y}{W \times ab \cos X}$$

except when $v=0$ or some multiple of 90°. Hence it is that a scale constructed without the very strictest regard to placing the knife edges at the angles of a right angled triangle must be deficient in sensitiveness.

The platform of the Sampson scale rests at its four corners on four carriages, C, which ,swinging feeely by the links H, keep the platform perfectly horizontal and preserve it from rubbing or jamming against the frame. The entire floor covered by the scale constructed to weigh 20,000 lbs. is only 15 feet by 10 feet 3 inches, and so far as its weighing properties are concerned the scale could easily have been built in one fourth or even one sixteenth the space.

The following experiments conducted in our presence show the beautiful results obtained by attention to the simple laws above mentioned, combined undoubtedly with skillful workmanship.

A weight of 4,000 lbs. being placed upon the platform and exactly balanced by a weight of 6 lbs. at the extremity of the steelyard, the addition of half a pound only on the platform caused the steelyard to strike the upper stop. The scale was then balaneed by adjusting the index weight to the half-pound point upon the steelyard and the half-pound weight then removed from the platform, when the steelyard fell and rested on the lower stop.

After exhibiting the deflection caused by the addition or subtraction of a half-pound weight on the scale while 4,000 lbs. were on the platform, the weights were heaped up first on one corner of the platform and then indifferently on different parts of the platform without the slightest deviation in the result or straining of the parts.

A scale constructed on this principle is in use at the weigh lock at Waterford, on the Champlain Canal and elsewhere, and has been very favorably reported on by the State Engineer and Surveyor in his report for 1862, but no explanation of the principle on which its remarkable delicacy depends has, we believe, ever before been given to the public.

The 20,000 lbs. scale referred to above is, we believe, to be seen at the company's office, No. 240 Broadway.

M. RICHARD LEVERSON.

New Mode of Operating Hay Forks.

A very simple and useful contrivance for unloading hay from the cart and depositing the same at any desired part of the barn, has been recently invented by D. L. Miller of Madison N. J. He uses a clutch pulley through which a rope is extended horizontally from one portion of the barn to another near the roof. To the pulley is another rope extending vertically from the way rope to which the fork is attached. It will be understood how easily with such an arrangement one man can unload and deposit in any part of the barn. The invention consists in the arrangement of rigging, it being adapted to the use of the well known large forks.

Blue Coloring Matter.

M C. A. Girard, of Paris, has patented improvements in the manufacture of blue coloring matter. He introduces into a distilling apparatus two parts of commercial diphenylamine and three parts of sesquichloride of carbon, and heats the mixture, taking care to maintain the temperature between 170 deg. and 190 deg. Centigrade. The blue color is rapidly developed, and in five or six hours the mass assumes a bronze aspect and becomes brittle on cooling. The melt with the bronze aspect is powdered and treated until complete exhaustion in a displacement apparatus with benzole or ether at a gentle heat. In this apparatus the warm solvent filters through the powdered melt and is afterward distilled, the vapor is condensed and returned on to the melt, and so on continually. The untransformed sesquichloride of carbon and commercial diphenylamine are dissolved as well as a small quantity of bluish violet; the greater part and the best part of the blue remains undissolved. The blue is then collected and dried, and may, after being dissolved in alcohol or methylated spirit, be at once employed in dyeing or printing; but, if it be desired to purify it further it may be dissolved in boiling alcohol, filtered and precipitated from the filtered solution by hydrochloric acid. The inventor has observed that pure ditolylamine yields under the same conditions a brown coloring matter; pure diphenylamine yields a blackish violet blue; and penyltolylamine a bluish violet or violet blue; but a mixture of diphenylamine and ditolylamine and of diphenylamine and phenyltolylamine in any proportions yields a blue. He, however, remarks that some proportions are better than others, and that two parts of diphenylamine and one part of ditolylamine are good proportions.

NEW PUBLICATIONS.

APPLETON'S HAND BOOK OF AMERICAN TRAVEL—THE NORTHERN TOUR. By Edward H. Hall. D. Appleton & Co., 443 Broadway, New York City.

Beginning with sensible and plain advice to travelers, as applicable to foreigners as our own people, this volume presents all the information required for a tour from Nova Scotia to California, including all the Eastern, Middle, and Western States and the Canadas. Plain directions as to railway and steamboat lines, hotels, objects of interest, and brief descriptions of places, without annoying and wearying with useless trash, give a peculiar value to this book, which some other more pretentious volumes do not possess. Maps of the country and plans of the cities through which the tourist may pass are bound in the book, and will be found to be a great convenience.

BRADSHAW'S HAND BOOK TO THE PARIS EXPOSITION, London. J. Wiley & Son, 535 Broadway, New York City.

This volume contains an alphabetical index of the classes of articles in the Exposition, with all the instruction necessary to visitors relative to the plan of the building, its approaches, prices of admission, and brief and comprehensive details of the general features of this great world show, with a fine map of Paris and its environs. It is timely and interesting, whether the reader is a visitor or only a home seeker for knowledge.

HISTORY OF THE ATLANTIC TELEGRAPH. By Henry M. Field. Second Edition. Charles Scribner & Co., 654 Broadway, New York City.

To any one who cares to read the record of a successful undertaking which puts to shame the wildest imaginings of romancists; who desires to know what human energy and determination can accomplish against the adverse operations and the almost insuperable obstacles of nature, we commend this volume. It seems, even in the details of the enterprise, like the fabulous and incredible statements of ancient story tellers, yet the result is apprehended every day by the people on both sides the Atlantic. The facts about the great submarine telegraph, although appearing occasionally in newspaper paragraphs, have never been so clearly stated as in this volume. We shall draw from them hereafter. Meanwhile we recommend the perusal of this book to all who believe in the ultimate sovereignty of man over nature. They cannot fail to be deeply interested.

KELLOGG'S UNITED STATES MERCANTILE REGISTER FOR 1867-8. Kellogg, Johnston, & Co., 116 Nassau street, New York City.

This work is a compendium of information of inestimable value to every business man. It is divided into two parts, the first including an amount and variety of useful information which otherwise must be sought in ponderous and numerous volumes. The internal revenue laws, including licenses and stamps; the tariff; weights and measures of all nations; general statistics of the country; value of foreign coins; the United States bankrupt law; mercantile laws of all the states; domestic and foreign postage; list of post-offices and telegraph stations, and many other convenient items of information are contained in part first. Part second is a business directory of all the principal cities of the Union, alphabetically arranged and handy for reference.

TROW'S NEW YORK CITY DIRECTORY. Compiled by H. Wilson, for the year ending May 1, 1868. John F. Trow, 52 Greene street, New York City.

This is one of the books, which, like the dictionary, contain only hard facts, and is of immense value to the business man, the resident, and the stranger. The compiler in his preface says: "It has required almost a half century of constant effort and unremitting practice to bring the complicated organization of forces into perfect working order which are necessary to the annual production of this work. But as the magnitude of the Directory has increased, its defects, we believe, have decreased." This issue contains 177,317 names.

PRINCIPLES OF MECHANISM AND MACHINERY OF TRANSMISSION. By Wm. Fairbairn, Esq., C. E. Henry Carey Baird, 406 Walnut street, Philadelphia.

This volume is a synopsis or abridgement of the author's large work on "Mills and Millwork," and is better adapted to the wants of American millwrights, machinists, and operatives than the former. It contains, in the "Principle of Mechanism," descriptions of most of the general combinations of machinery, with plans, formulas, and explanations, and the chapters devoted to "Machinery of Transmission" give details of all the different varieties of pulleys, gears, screws, clutches, etc., with a treatise on shafting It is illustrated with engravings, diagrams, and plans, and has a copious index.

THE AMERICAN ANNUAL CYCLOPEDIA and Register of Important Events of the year 1866, Embracing Political, Civil, Military, and Social Affairs; Public Documents; Biography, Statistics, Commerce, Finance, Literature, Science, Agriculture, and Mechanical Industry. Volume VI. pp. 800, 8vo. New York. D. Appleton & Co.

This important and elaborate Annual makes its appearance with its usual characteristics, which are well summed up on the title page as quoted above. A record of one of the memorable years of the world's history, it could hardly escape a plethora of matter more fascinating and marvelous than fiction, and such as every intelligent person wishes to have embodied, indexed and at hand for ready reference in the future. It is appropriately garnished with a portrait of the central political figure of the year, Count Bismarck, and also with the attendant figure of King William I, of Prussia, and with that of Garibaldi as a background.

CHEMICAL NEWS—REPRINT.

We are glad to learn that W. A. Townsend & Adams, Publishers, of this city, have undertaken the republication of the *London Chemical News*. This is one of our best foreign publications, but the high price which it has cost subscribers in this country, has prevented a large circulation. The reprint will be afforded so cheap that the publication must have a large circulation. A prospectus giving full particulars may be found in our advertising columns.

THE CORRELATION AND CONSERVATION OF GRAVITATION AND HEAT, AND SOME OF THE EFFECTS OF THESE FORCES ON THE SOLAR SYSTEM. By Ethan S. Chapin. Springfield, Mass. Lewis J. Powers & Brother. pp. 120.

The writer of this book is evidently an independent and fearless thinker. He does not hesitate to disagree with doctrines which have stood for centuries. The book is speculative, and treats of the most exalted subjects.

RAILWAYS IN ITALY.—By the transfer of Venetia to the kingdom of Italy, the network of Italian railways has been increased to the extent of 600 miles. An uninterrupted line of railway has now been established on the eastern side of the Italian Peninsula. The opening of the line from Ancona to Foligno and Rome, puts the north in communication with Naples. Florence has now also uninterrupted railway communication with Rome.

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Improvement in Straw and Hay Cutters.

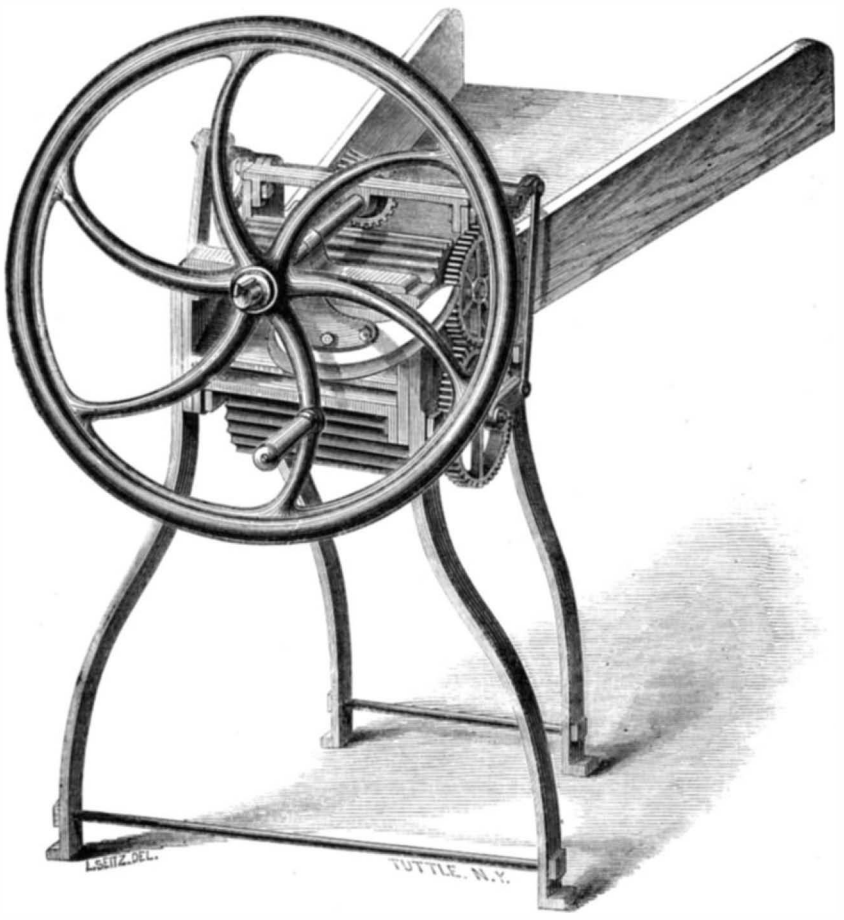
The intention of the inventor of this machine is to construct a hay and straw cutter which *cuts* rather than squeezes off the fibers. Cutting is usually, when the process is properly performed, a combination of pressure and a drawing motion. If the first is used alone the labor is much increased, and if the latter alone the material glides away from the cutting edge. In the machine shown in the engraving both these elements are combined in such a degree that they produce the best results.

In its general appearance the machine does not differ greatly from those ordinarily in use, but in its details it is entirely different. The machine shown in the engraving has the fly wheel and crank in the front, but it may be so modified as to place the crank, as usual, at the side, on the shaft seen running across the machine. On the central shaft is a curved knife forming a segment of a circle, the edge of which is an eccentric relative to the shaft, and thus has a drawing action.

The shaft carrying the fly wheel and crank has at its other end a bevel gear engaging with a similar gear on the transverse shaft, on one end of which is a crank that turns the feed roller—the one seen in the engraving—and the other end of which has a cam that engages with a lever which depresses a jointed plate that presses the hay or straw closely against the lower side of the mouth of the trough, ready for the action of the knife. The motions of the cam, lever, and knife are coincident, so that while the knife is in action on the hay the plate presses it closely together.

Connected with the lower or feed roller by gears, seen at the side of the machine, is an upper roller intended to reduce the friction of feeding the straw or hay to the knife. It is evidently a combination in accordance with correct principles in mechanics, and well adapted to the cutting of feed, etc.

It was patented Aug. 14, 1866, by Heinrich Gottfried. The whole right, or rights for States are for sale. For further information interested parties are referred to Mr. Gottfried, care of Joseph Peter, 241 Bowery, New York city, where a machine can be seen in operation.



GOTTFRIED'S IMPROVED HAY CUTTER.

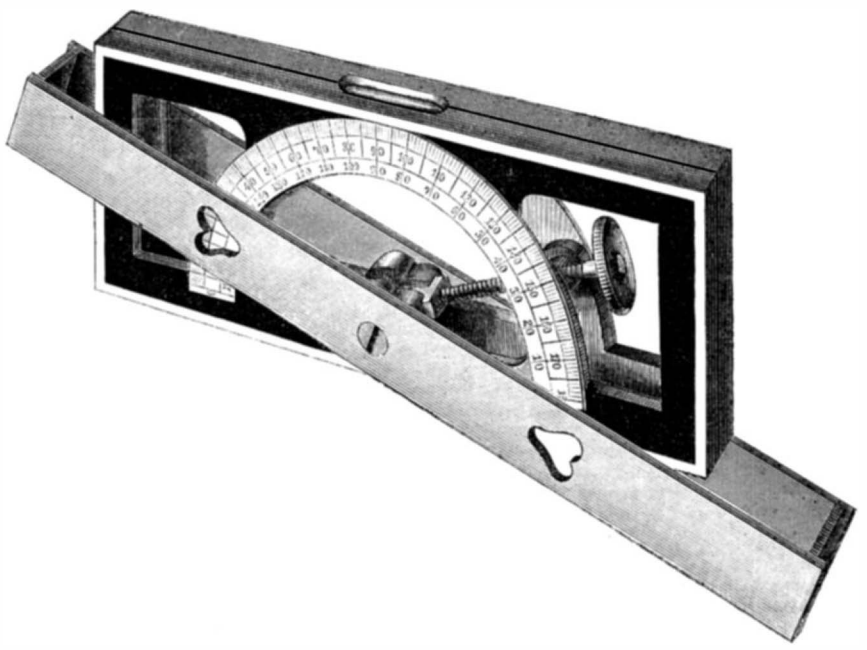
Combined Level, Square and Bevel.

The instrument herewith represented is intended to supersede a number of separate tools used in the shop of the mechanic. It is used as a spirit level, try-square, clinometer, bevel protractor, etc., and is suitable for the machinist, wood worker, draftsman, and surveyor.

As will be seen, it is a rectangular metallic frame or box on the sides of which are secured graded semicircles. In the top is seated the tube of a spirit level. Pivoted at the center near the bottom is a steel frame with heart-shaped apertures in its sides to permit the figures on the scale to be seen when the frame is set at any angle. A thumb-screw with a sliding block secures the pivoted frame in any position desired. The whole instru. ment is capable of being carried in the pocket—and being wholly of metal—steel and brass—will not be easily broken.

The machinist will find it handy in finishing up six-square nuts, in setting the planer head to cut bevels, and in various other operations. The pattern maker can record the angles of his work by its means so that the finisher can work exact to the original design or pattern. The carpenter and joiner can employ it in laying out his work and also in fitting it. It is also a handy article for the use of engineers, surveyors, and others who may be employed in running lines or locat ing claims.

It was patented through the Scientific American Patent Agency by G. L. Chamberlin, January 1st, 1867. For further information address Warden and Batchelder, Corner Duquesne and Irwin streets, Pittsburgh, Pa.



CHAMBERLIN'S COMBINATION LEVEL.

The Mechanical "Ignis Fatuus."

One of our correspondents who believes in studying nature rather than in trying to violate her laws with impunity, writes thus:—

You very properly decline discussing the cause of failure of each and every attempt at producing a self-moving machine, or one capable of generating power at least equal to the friction among its parts and through the atmosphere. Will the fundamental laws of *vis inertiæ* never be recognized and understood? Until the principle of vitality is imparted to matter, what is the use of attempting to persuade it to move itself? I have had occasion to examine several of these contrivances, some of them very complicated and ingeniously put together, but I have never found any difficulty in showing that the same power applied directly would produce a greater effect, without the aid of the power-gaining machinery than with it. It is to be hoped the rising generation may be so grounded in the inherent laws of nature as to work in accord with, and not against them. W. J. B.

Gummy Leather.

The Hide and Leather Interest explains the prevalence of gummy leather by the substitution of fish for neats-foot oil. "In the earlier days, the oil used in the finishing of leather was neats-foot only (we believe such is the case with English tanned leather still); then we heard nothing of gummy leather; but as time rolled on and neats-foot oil grew dearer, leather dressers sought out some cheaper substitute, and the article nearest neats-foot oil was supposed to be the oil expressed from fish. The hide of the cow or the calf has a strong affinity for neats-foot oil, of course; even the hide of the horse absorbs this oil, and holds it. This oil does not gum, and will not, when once absorbed by the leather, exude to the surface. Not so with fish oil, however. This is something of quite another character. The oil of the fish differs as much chemically from the oil of the hoof of the ox or the cow as it does from that obtained from the vegetable world, which contains a still larger amount of gummy property. Fish oils are heating or burning in their character, and will ruin any leather they are applied to; the stock hardens, and finally cracks, through the effects of the stuffing of which this oil is the main ingredient. If fish oil and neats-foot oil are mixed, the evil is lessened; and when tallow is incorporated, the bad results of the fish oils are partially warded off; but the application of fish oil to leather kills the substance, and is the prime cause of the gum found on the surface.

The Whitworth--American Engine.

This notable feature of the Paris Exposition, of which our foreign correspondence gives a full description, is the subject of the following remarks in *Engineering*: "The engine, however, in the English department which is most deserving our attention is one which steps far beyond any other steam engine in the Exhibition in its character and purpose. It is derived from Corliss': it is improved by two Americans, Allen and Porter, and it is constructed with the forethought, proportion, symmetry, and truth of construction which have so long distinguished all that issues from the establishment of Whitworth, of Manchester.

Having overtaken Mr. Corliss in the application of the steam in his cylinder, the constructors of this engine now make a great stride to go beyond him. They say, "Our valves are not only as good as 'Corliss', but they are, withal, so smooth and gentle in their action that they are capable of working much more rapidly." They have therefore determined to use this smoothness of action for the development of a far higher amount of power out of an engine of given size than had heretofore been accomplished. Corliss' engine, like other fixed steam-engines, performs admirably with a piston traveling, say, 200 feet a minute, or about the usual traditional speed of the steam engine. The Allen-Porter-Whitworth engine leaves this behind with a long stride: its piston starts away at the usual speed of 800 feet per minute, and in doing so quadruples the work done by an engine of given size and power. This is certainly an unparalled feat in the gymnastics of the steam engine, and, if successfully accomplished, seems to promise an important revolution in machinery.

It is not to be overlooked that we are speaking of a condensing engine, and, what is more surprising still, an engine whose air-pump works with the same speed as its steam piston. The eye scarcely can see the plunger of the air-pump clearly, from the rapidity with which it travels in and out of the condenser. The plunger looks more like the elongated shot of a Whitworth cannon than the piston of an air pump: in shape, it is truly an elongated steel or iron shot, which strikes the water in the air-pump with such velocity that if the point of the plunger were not sharpened into a parabolic curve its stroke on the water would shatter the condenser to pieces. As it is constructed, however, by means of ingenious hydraulic mechanism, the rapid stroke of the air-pump is converted into so gentle a rise and fall of the water that the valves work with scarcely a sound, and a gentle throb when your hand is laid on the condenser is all that tells you of the pulsation going on within. The engine is a marvel of ingenuity and design.

Rapidity of Organic Growth.

As atoms are commonly distinguished as the elementary units of inorganic matter, so cells form the ultimate sub-divisions of organic structure, and by their increase in size and multiplication in number, all vegetable growth is produced. The size of these cells varies from about the thirtieth to the thousandth of an inch in diameter. An ordinary size is from $\frac{1}{300}$ to $\frac{1}{500}$ of an inch; so that there may generally be from 27 to 125 millions of cells contained in one cubic inch Remembering that many stems shoot up at the rate of an inch or two, or sometimes three or four inches a day, we may form some idea of the rapidity of their formation. The giant puff-ball has been known to enlarge from an inch to nearly a foot in diameter, in a single night. A still more remarkable example is the huge flowering stem of the century-plant. After accumulating its energies for so many years, it at last sends up a flowering stalk which grows at the rate of twelve inches per day, until about six inches in diameter. Supposing these cells to average $\frac{1}{300}$ of an inch in diameter, nearly one thousand millions of cells are consequently formed every hour.

French Washing Machinery.

The soiled linen of the Grand Hôtel, the Hôtel du Louvre, the Grand Café, and of a few of the other hotels and cafés in Paris, is washed at the rate of 40,000 pieces a day, at the Blanchisserie de Courcelles, three miles or so from the St. Lazare terminus of the Western Railway The linen is boiled with soap and soda and then washed in hollow wheels, rinsed, partly dried by centrifugal machines, and for the rest in hot-air ovens, which carry off neaaly three pounds of moisture per pound of coal burnt, and is finally ironed between polished rollers, and then packed ready for return to Paris.

Mechanics' Exhibition at the Maryland Institute.

The twentieth annual exhibition of American manufactures under the direction of the Maryland Institute, will be held in Baltimore, Md., from the 15th of October to the 12th of November, 1867. The building was constructed expressly for such exhibitions, and is unequalled in the country for the purpose. Manufacturers, mechanics, and inventors throughout the country are requested to contribute. Premiums will be offered and steam power will be furnished gratuitously for machinery. All informatien desired in regard to the exhibition may be obtained on addressing J. H. Tubker, Esq,, Baltimore, Md.

A NOVEL PRINCIPLE of compensation to victims of railway accidents is advocated by the English Railway Commission. They think the amount of compensation to be paid by the Company in fault should be limited to some established multiple of the rate of fare per mile paid by the sufferer: say £100 to the penny for capital cases; but that any passenger may require the Company to insure him to any additional amount by paying in proportion.

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THE PARIS EXPOSITION---OFFICIAL LIST OF THE AWARDS TO AMERICAN EXHIBITORS.

The following is an official list of awards to Americans by the committees of the Grand Exposition, as sent by the Atlantic Telegraph. Of course it may be expected that some errors have occurred in its transmission. The names are given in the order in which the report will be made.

GRAND PRIZES.

M. Chapin, Lawrence, Mass—Well-conducted Factory.
Prof. Hughes, Kentucky—Printing Telegraph.
Cyrus W. Field, N. Y.—Promoter of the System of Ocean Telegraphy.
Dr. F. W. Evans, Paris—Sanitary Collection.

GOLD MEDALS.

Steinway & Sons, N. Y.—Pianos.
Chickering & Sons, N. Y. and Boston—Pianos.
S. S. White, Philadelphia—Artificial Teeth, etc,
H. D. Walbridge, N. Y.—Minerals from Idaho
J. P. Whitney, Boston—Minerals from Colerado.
Louis Trager, Concordia Parish, La.—Cotton.
Victor Meyer, Concordia Parish, La.—Cotton.
C. H. McCormick, Chicago—Mowing Machines.
W. A. Wood, Hoosick Falls, N. Y.—Mowing Machines.
Corliss Steam Engine Co., Providence, R. I.—Steam Engine.
William Sellers & Co., Philadelphia—Machine Tools.
Wheeler & Wilson, N. Y.—Sewing Machines.
Elias Howe, N. Y.—Inventor of Sewing Machines.
C. B. Rogers & Co., Norwich, Conn.—Wood-Working Machinery.
Patrick Welch, N. Y.—Type Dressing Machine.
Locomotive Works, Paterson, N. J.—Locomotive Steam Engine.

SILVER MEDALS.

Fred. E. Church, N. Y.—Oil Painting.
L. M. Rutherford, N. Y.—Photographs.
Mason & Hamlin, N. Y.—Organs.
J. K. Barnes, Surgeon-General, U. S. A.—Military Surgical Apparatus.
S. D. Tillman, N. Y.—Tonometer.
Mrs. Rich'd F. Bond, Boston—Astronomical Instruments and Chronometers.
R. B. Tolles, Canastota, N. Y.—Microscope and Telescope Glasses, Eye-pieces and Telescope.
Wm. Wales, Fort Lee, N. J.—Microscopic Object Glasses.
J. R. Brown & Sharpe, Providence, R. I.—Measures, Gages, etc.
Tink r Man. Co, N. Y.—Bronzes.
New York Mills, N. Y.—Fine Muslins.
Clark Thread Co., Newark, N. J.—Thread.
S. Fournier, New Orleans.—Regulating Telltale Clocks, etc.
Webster Woolen Mills, Webster, Mass Woolen and Cotton Fabrics and Jaconets, etc.
J. L. Hays, Boston.—Series of Woolen Fabrics
E. C. Burt, N. Y.—Machine Sewed Boots and Shoes.
Colt's Patent Arms Man. Co. Hartford, Ct.—Colt's Fire Arms.
E. Remington & Sons, Illion, N. Y.—Military and Sporting Fire Arms.
Smith & Wesson, Springfield, Mass.—Fire Arms and Metallic Cartridges.
Windsor Man. Co. Windsor, Vt.—Fire Arms.
Spencer Rifle Co. Boston.—Spencer Rifles.
Douglas Ax Co. Boston—Axes, etc.
J B. Taft, Chester, Mass.—Emery stone.
State of Illinois—Cereals.
J. B. Picque, San Francisco.—Collection of California Minerals.
Prof. W. P. Blake, San Francisco, Cal.—Minerals.
Bigelow & Co, Boston.—Coffee.
Park Brothers & Co., Pittsburgh, Pa.—Edge Tools.
F. S. Pease, Buffalo, N. Y.—Oils.
Grafton & Co., Louisiana—Cotton.
A. Delpit & Co., New Orleans.—Tobacco.
G. J. Wardwell, Poultney, Vt.—Stone Channeling and Quarrying Machine.
Collins & Co., N. Y.—Plows.
Shultz & Warker, N. Y.—Soda-water Fountains.
Fairbanks & Co., N. Y.—Standard Scales.
J. R. Browne & Sharpe, Providence, R. I.—Revolving Head-screw Machine and Universal Milling Machine.
Bement & Dougherty, Philadelphia, Pa.—Machine tools.
Cool, Sherman & Co., Glen Falls, N. Y.—Barrel Machine.
I. W. Lamb, Rochester, N. Y.—Knitting Machine.
M. Opper, N. Y.—Corset Loom.
George Crompton, Worcester, Mass.—Crompton Loom.
American Button-hole Co., Philadelphia.—Button-hole Machine.
Weed Sewing machine Co., N. Y.—Sewing machines.
Florence Sewing-machine Co., N. Y.—Sewing machines.
Baxter D. Whitney, Winchendon, Mass.—Wood-working machines.
Wood Brothers, N. Y.—Phæton.
James Hall & Son, Boston.—Buggy.
Isaac Gregg, Philadelphia—Brick Machine.
Yale and Winn Manufacturing Co., Shelburne Falls, Mass.—Locks.
Chapin & Wells, Chicago—Swing Bridge.
Board of Public Works, Chicago—Plan of the Chicago Tunnel.
J. A. Robinson, N. Y.—Daboll Fog Trumpet.
Culbertson & Co., Chicago—Salt Meats.
Glencove Starch Co., N. Y.—Starch and Malzena.
C. Duffield, Chicago—American Westphalia Hams.
Cape, Culver & Co., N. Y.—Manhattan Hams.
W. Baker & Co., Dorchester, Mass.—Chocolate.
G. S. Lawrence, Louisiana—Sugar.
Dr. S. G. Howe, Boston—Books for the Blind.

BRONZE MEDALS.

D. Appleton & Co., N. Y—Books.
Houghton & Co., Riverside, Cambridge Mass—Books.
G. & C. Merriam, Springfield, Mass—Webster's Dictionary.
Automatic Boiler Feeder Co., Philadelphia—Boiler Feeder.
Jessup & Moore, Philadelphia—Paper.
W. F. Murphy & Sons, Philadelphia—Blank Books.
erican Lead Pencil Co., N. Y.—Lead Pencils.
A. G. Day, Seymour, Conn.—Invisible Lead Pencils.
Secombe Man'f'ng Co,, N. Y.—Ribbon Hand stamp.
L. W. Fairchild & Co., N. Y.—Gold Pens
Sigismund Beer, N. Y.—Stereoscopes.
Geo. Gemunder, N. Y.—Violins.
Schreiber Cornet Man. Co., N. Y—Brass Instruments.
E. D. Hudson, N. Y.—Artificial Limbs.
Johnson & Lund, Philadelphia—Artificial Teeth.
Cummings & Sons, ——, Hospital Car.
C. Abbey & Sons, Philadelphia—Geld Leaf for filling teeth.
Milton Barlow, Midway, Ky.—Planetarium.
A. J. Johnson, N. Y.—Family Atlas.
J. B. Lyon & Co., Pittsburgh—Glassware.
W. H. Townsend, N. Y.—Oil-cloth.
Tiffany & Co., N. Y.—Silver Ware.
Pratt & Wentworth, Boston—Cooking Stoves.
Wright & Co., Philrdelphia—Perfumery.
The Hadley Co., Holyoke, Mass.-Spool Cotton.
S. Slater & Sons, Webster, Mass—Cotton goods.
H. Stursburg & Co., N. Y.—Beaver cloths.
Mission Woolen Mills, San Francisco—Blankets, flannels, &c.
F. Sasche & Sons, Philadelphia—Fine Shirts.
H. Haupt, Philadelphia—Steam drill tunnling machine.
Deere & Co., Moline, Ill.—Steel Plow irons.
J. G. Perry, Kingston, R. I.—Mowing machine.
Partridge Fork Works, Leominster, Mass.—Spading & manure forks, &c
Morris Tasker & Co., Philadelphia—Wringing machine.
D. H. Goodell, Antrim, N. Y.—Apple pare .
Haaglen & Graflin, Dayton, Ohio—Tobacco cutting machine.
W. & D. Douglas, Middletown, Conn—Pumps.
Howe Scale Co., N. Y.—Scales.
L. H. Olmstead, Stamford, Ct.—Friction Clutch Pulley.
T. R. Pickering, N. Y.—Governor of Steam Engines.
J. B. Root, Boston—Steam Engine.
P. H. & F. M. Roots, Connersville, Ind.—Rotary Blower.
Shaw Union Air Engine Co., Boston—Hot Air Engines.
Wickersham Nail Co., Boston—Nail machine.
D. L. Harris & Co., Springfield, Mass.—Lathe machine.
J. S. Justice, Philadelphia—Power Hammer.
C. L. Goddard, Boston—Mestiza Burring Picker.
Southern Cotton Gin Co., Springfield, Mass.—Cotton Gin.
Union Button-hole Co.—Button-hole Machine.
A. B. Howe, N. Y.—Sewing machines.
Bartram & Fanton, Danbury, Ct—Sewing and Button-hole machine.
Mumford & Co., Detroit, Mich.—Boot Former.
C. A. Shaw, Biddeford, Me.—Knitting machines.
J. E. Sweet, Syracuse, N. Y.—Composing machine.
Baltimore and Cuba Smelting Co., Baltimore—Ingot and Sheet Copper.
G. F. Warner & Co., New Haven, Ct.—Malleable Iron Castings.
Danglar Man. Co., N. Y.—Edge Tools.
S. H. Randall, N. Y.—Mica.
C. G. Gunther & Sons, N. Y.—Furs.
J. M. Humphris, Louisiana—Cotton.
F. C. Williams, Richmond, Va.—Virginia Tobacco.
J. P. Sarrazin, Louisiana—Perrique Tobacco.
A. J. & J. H. House—Co-operators.
Jackson & Co-operators.
J. W. Carroll & Co., Lynchburgh, Va.—Smoking Tobacco.
C. H. Lillienthal, N. Y.—Tobacco and Snuff
Wisconsin Agricultural Society—Agricultural collection.
Richardson & Co., Wis.,—Wool.
A. G. Day, Seymour, Ct.—Rubber goods.
H. G. Hotchkiss, Lyons, N. Y.—Oil of Spearmint, Peppermint, and Wintergreen.
L. B. Hotchkiss, Phelps, N. Y.—Spearmint and Peppermint.
Belmont Oil Co., Phila.,—Petroleum.
West Virginia—Petroleum.
Babcock & Co., Boston—Petroleum.
Marietta and Gales Fork Co., Marietta, Ohio—Petroleum.
F. H. Holliday, N. Y. Chemicals.
Joseph Hirch, Chicago—Albumen.
A. Fries, incinnati, O—Extracts.
Degener & Weiler, N. Y.—Printing Presses.
Fairbanks & Co., N. Y-Railroad Scales.
Herring, Farrel & Sherman, N. Y.—Fireproof Safes.
J. B. Van Duzen—Model of *Fleetwing*.
Brown & Level, N. Y—Model Tackle.
Department of Agriculture, Washington, D. C.—Cereals of the U. S.
State Ohio—Cereals.
State Wisconsin—Cereals.
State Kansas—Cereals.
W. S. Carpenter, Westchester Co., N. Y.—Corn.
McPherson & Donald Smith, N. Y.—Ales.

HONORABLE MENTION.

C. K. Landis, Vineland, N. J.—Model Farms.
Willard & Co., N. Y.—Objectives.
Wm. Selpho & Co., N. Y.—Artificia Limbs.
Robert. Bates, Philadelphia—Instrument to Cure Stammering.
George Davidson, Washington, D. C.—Sextant
Peter Glass, Boston—Mosaic Inlaid Center Table.
G. W. Chipman, Boston—Carpetings.
Howell Brothers, Philadelphia—Paper Hangings.
New Haven Clock Co.—Clocks.
Kaldenberg & Son, N. Y.—Meerschaum Pipes.
Bell & Co., Alabama—Muslins.
Williams Silk Co., N. Y.—Silk Twist.
Washington Mills. Boston—Shawls.
Linthium & Co., N. Y.—Spring Overcoats.
J. C. Zallee, St. Louis—Men's Clothing,
State of Alabama—Cotton.
Montague & Carlos, Louisiana—Mosses.
F. S. Cozzens. N. Y.—Cigars from American Tobacco.
Bourgeois & Co., Louisiana—Tobacco.
D. J. Brown, Boston—Leather.
C. Korner, N. Y.—Leather.
H. Tilden, Boston—Sifter.
Metropolitan Co., N. Y.—Washing Machines.
J. Ward & Co., N. Y.—Washing Machines.
S, T. Bacon, Boston—Baking Machine,
J. Prentice, N. Y.—Cigar Machine.
Empire Ma hine Co., N. Y.—Sewing Machines.
Stephenson & Son, N. Y.—Horse Cars.
Chas. Wellman, N. Y.—Saddles.
E. Page, N. Y.,—Cars.
Portland Packing Co.—Canned Food.
Catawba Wines.
C. Butler, Cincinnati—Catawba Wines.
Pleasant Valley Wine Co., and F. S. Cozzens, N. Y.—Variety of Wines.
American Co., St. Louis—Wines.
S. S. Squire, New London, Ct.—Preserved Food.
Brandon Kaolin and Paint Co., Brandon, Vt.—Specimens of Paint.
A Tambourg, Louisiana—Tobacco.
R. M. Smith, Baltimore—Petroleum.
Olof Johnson, Louisiana—Sugar.
Purrington & Co., N. Y.—Sweeper.
Minnesota—Cereals.
Iowa—Cereals.
G. & C. Williams, Louisiana—Sugar.
James H. Jackson, N. Y.—Minerals.
Joel Wharton, N. Y.—Minerals.

THE ENGINEER says:—

"Although our Brother Jonathan, impeded by the great distance which his wares have had to travel, has sent but a very small quota to Paris, he has made an admirable selection in what he has sent. We doubt if any nation in proportion to the amount of its exhibit, shows more elaborately and really well-finished workmanship, and certainly none has the imprint of vigorous inventive genius more clearly marked on its productions. Almost every machine and engine exhibited in the main gallery by the United States, has some special peculiarity stamped upon it which, whether it be really an invention or improvement, or only a questionable modification, at least shows the extraordinary activity of North American thought."

As a commentary on the above, we may add a report from Commissioner Beckwith to the Department of State, showing that of the 524 United States exhibitors at Paris, 262, or exactly one-half, received honorable awards. These awards include 4 grand prizes, 17 gold medals, 52 silver medals, 103 bronze medals, and honorable mention of 79 exhibitors.

Exposition Notes.

SHAW'S HOT-AIR ENGINE of 20-horse power, exhibited in an annexe or shed of its own in the park, continues to work regularly, and to attract a good deal of attention. An indicator has been fitted, and diagrams have been taken which show that the engine performs well relatively with the fuel consumed—a promising result in a new engine so widely removed in all essential points from engines of the usual character.

ONE of the most valuable institutions of Paris is the asphalte with which the footpaths and roads are made. The London asphalte, whether for footways or roadways, has been a complete failure, whereas the Parisian is a most eminent success—a result not imputable to the nature of the traffic so much as to the nature of the composition. The asphalte used for the footways after being heated very hot by a fire applied to a cylindrical vessel, with trunnions at the ends, so that it may be tilted and the contents poured out at a large square bung-hole by rotating it by a worm-wheel upon the trunnions, is emptied into buckets, and is spread by hot irons. Whereas that used for the roads is a brown powder consolidated by hot iron rammers, and the surface is smoothed by hot irons, and is finally rolled by a heavy iron roller. The asphalte thus laid is durable, the traction upon it nearly as easy as upon a railway, and one material benefit is that there is hardly any noise.

WE ARE informed that a trial is shortly to take place between French and English guns against French and English armor-plate targets. At this competition, unless the present rules be relaxed, no naval or military officer belonging to either country, with the exception of such as may be nominated jurors for the contest, nor any representative of the press, will be admitted. It is to be hoped, however, that such an absurd rule will be rescinded, and that the public will be permitted to enjoy an equal opportunity of judging for themselves the results of such a contest as is afforded in the case of all other competitive tests of articles or machines in the Exhibition which require such proofs in order to ascertain conclusively their relative merits and advantages.—*Engineering.*

A FRENCH CHEMICAL PRINTING MACHINE is exhibited, printing manifold through prepared paper, without ink, in red or black, and bringing the types into operation by means of keys, with great rapidity. According to the London *Printers' Register*, the specimen on exhibition contains one hundred and forty five letters in seven different kinds of types and two colors—red and black—composed, and one hundred copies printed, all in three minutes. The printing was done in thirty two seconds, and the machines appear to be chiefly intended for cards and bills, letter heads, etc. The colors are good and well printed.

AMONG the carriages are two droska those uncomfortable Russian hackney carriages in which the driver and his "fares" sit in single file astride a longitudinal bench supported on four small wheels.

THE ONLY artillery exhibited in the American court is a Gatling's and a Ferris gun, the latter of which is a polygrooved rifled breech-loader, throwing a ball of 3-lb. weight with a charge of 24 oz. of powder. By the side of this gun is a small piece of iron plate 3-in. in thickness, composed of three 1-in plates bolted together, and through which are several perforations made by shot fired from the gun at 50 yards distance. The total range of this gun, at an elevation of 35 degrees, is stated to be nine miles.

Editorial Summary.

THE HYDRO-PNEUMATIC HOIST, recently patented in England, is an apparatus in which the chain, with a hoisting cage at each end, passes over two sheaves, so that each cage ascends while the other descends. The power is applied through the medium, alternately, of the weight and buoyancy of a bell-shaped counterweight moving like a piston in a vertical pipe filled with water. The weight being adjusted so as in descending to lift the load of one cage, (the cage itself being balanced by the other and descending cage), on reaching the bottom of the pipe, it is pumped full of air, its capacity being also so adjusted that its buoyancy when filled with air shall be sufficient to lift the load of the other cage. The mode of braking, is by gradually contracting the space for the passage of the water between the sides of the pipe and the bell-shaped weight. The weight can be so geared as to lift the load through twice the distance travelled by the weight.

IRON ETC.—A co-operative foundry has been established in Rochester. The organization has purchased the Novelty Works, for the sum of $30,000.—The Shepard Iron Works, of Buffalo, have recently built an engine for the City Water Works, cost $40,000, beams, 22 feet long, fly wheel 24 feet in diameter, and 40 tuns in weight.—The Arms Company, of Newburyport, are manufacturing machines for carving wood, marble, stone and copper.—The Providence Tool Company have contracted to furnish the Swiss Government with 15,000 Peabody rifles and to alter 44,000 muzzle-loading muskets to breech-loaders.—The rolling mills recently started at Portland have orders for six months ahead. They turn out about 1,000 tuns of railroad iron per month, one-half of which is taken by the Grand Trunk Railroad Company.

A STEEL SCREW PROPELLER, one of the first we believe of any considerable size, has been cast by Messrs, Naylor, Vickers & Co., of Sheffield, and is really a very fine piece of work considering that it is a first attempt. The screw is three-bladed, 10ft. 2in. diameter, and 21ft. pitch, and weighs 1 ton 18 cwt. 3 qrs.; a cast iron propeller of the same dimensions on the sister boat Leeds, weighing 2 tons 12 cwt. 2 qrs.; representing 13 cwt. 3 qrs. in favor of steel. The steel screw might have been lighter, but Mr. Bretelle, chief of the marine department of the company, for whom it was made, feared to reduce the proportions too much in the absence of further experience.

HYDRAULIC PROPULSION.—It is more than likely that the system of propelling by means of centrifugal pumps will prove very successful in its application to canal boats. The North Moor Foundery Company are now engaged in executing an order for fourteen boats, each about 40 tuns burden, the whole of which are to be propelled on the above system.

THERE are now 400 mills for crushing quartz and cement in California, 40 in Idaho, 30 in Montana, and 14 in Oregon, which have cost nearly $10,000,000 dollars.

EXPERIMENTS (says the *Owl*) are being made by the French Government upon a system of construction for cannon, by which the interior is made of steel and the exterior of bronze. This plated cannon is expected to give the greatest amount of wear with the least risk of explosion.

OZONE.—In another column we publish a notice of an English Patent, issued sometime since, for decolorising sugar by means of ozone. The generator employed for this purpose consists of a number of flat sheets of glass, coated with tin-foil, and piled one on the other, but slightly separated. Each plate represents a Leyden jar, and when the whole number are electrified, a stream of air forced through from one end to the other becomes so strongly ozonised that breathing it is painful and dangerous. The stream of ozonised air thus produced can be used for bleaching and other chemical purposes.

A PORTABLE COMPRESSED ATMOSPHERE, similar to Galibert's, is carried by the divers of the American Submarine Company, dispensing with all communication with the general atmosphere, both for the sustenance of life and of combustion within their lamps. The compressed air in the reservoir is also, by turning a cock, allowed to expand into and distend a pair of floats attached to the diving dress, by which the diver can ascend to the surface and float, head and shoulders out of water. A charge of air will last under water about four hours.

EXPERIMENTS have proved that if magnesium riband is pressed broader and thinner, and by this means made to present a larger surface to the oxygen of the atmosphere for the same weight of metal, it burns much more steadily and surely.

BUSINESS AND MANUFACTURING ITEMS.

RAILROADS, ETC.—The Boston, Hartford and Erie Railroad Co. intend to establish coal deposits at all the stations on their road, from which residents in the vicinity can procure their supplies at moderate prices.—The Western Railroad is altering its heavy freight engines to coal burners, at its shops in Springfield.—Dull & Gowan, the new contractors on the Hoosac tunnel, will immediately put on a force of 200 men, so that the work will be carried on night and day. They will also sink two shafts, that the excavations may be made from six faces at the same time.—New Haven has voted, 3,256 to 473, to subscribe $200,000 to the capital stock of the New Haven and Derby Railroad.—The Chicago, Rock Island & Pacific Railroad Company has been mortgaged to John A. Stewart and Wm. H. Osborn, of New York, for the sum of nine million dollars. The revenue stamps amounted to nine thousand dollars.—The land telegraph from Gainesville, Florida, to Punta Rosa, and which will there connect with the marine cable to Cuba, is finished. The line, 275 miles long, was built in 37½ days. It will be connected with the Western Union Line at Lake City, Florida, and a line will be built to connect that place with Savannah and Georgia. The submarine cable to Cuba will be laid in July.—A company of Eastern iron manufacturers have gone on an excursion to the mining regions in South East Missouri. They propose to furnish $800,000, if the people of St. Josephs will subscribe $300,000, and finish the St. Josephs & Council Bluffs Railroad by January next.—The work on the Chicago tunnel has been stopped by the caving in of the whole structure.—The Hudson River traffic, for the first time in several years, is excited by high competition for freight and passengers. The Athens "cut off," a new branch built by the Central Railroad Company, from Schenectady to Athens, on the Hudson, was opened in May for passenger traffic, the magnificent palace steamers *Drew* and *Dean Richmond* of the People's Line, running in connection with the trains. The same concern continue to run their Albany boats as usual, but the Troy line, consisting of the *Connecticut* and *Hero*, wages an old fashioned opposition and has knocked down the fare, step by step, to fifty cents from New York to Troy. In freight, the Hudson River Railroad endeavors to head off the Athens "cut off," by reductions in rates, but the steamers have the cheaper highway.—A new way to use steam on canals without agitating the water, is under trial at Buffalo, with a view to the formation of a company to apply the plan throughout the Erie Canal. A steel wire cable, stretched from point to point, takes a turn around a drum worked by steam on the deck of the vessel, which is thus quietly propelled.—Bergen Cut, between Jersey City and Newark, is to be laid with steel rails; preceding trials having satisfied the company of the economy of the change, which will probably be carried gradually throughout the line to Philadelphia.—The Summit Tunnel, on the Pacific Railroad, is progressing at the rate of sixty feet a week, at four points, and at this rate will be completed by the middle of August.

MISCELLANEOUS.—About 200,000 quarts of strawberries are brought to New York every day from New Jersey and other places South. The sales of strawberries at Vineland amount to $2,000 per day. A farmer near Salem, Ill., sold his strawberry crop of forty acres, to parties in Chicago, a few days ago, for $50,000.—The editor of the *California Farmer* acknowledges a present of a lot of large and delicious oranges from a tree which had 464 oranges on it on the 18th of January, and has 100 left, while its top is covered with the blossoms of another crop.—The Peruvian Government contracts with a firm in Philadelphia for 1,200,000 bags a year for packing guano.—The Internal Revenue Department in the first sixty days of the vigorous enforcement of the new whisky law condemned 97,300 gallons of whisky, besides about 250,000 gallons under seizure.—Western farmers are crowding their grain to market. In Delaware county, Iowa, the price of wheat fell within a few weeks from $2 26 to $1 50.—The Chicago City Directory this year, about to be published, contains 89,103 names, being an increase of 12,889 over the number contained in the Directory of last year. The rule in cities, to ascertain the total population, is to allow three persons to every name enumerated in the Directory. According to this rule Chicago now has a population of 267,399.—Forty steamboats bound for Fort Benton, Montana, laden with a hundred and twenty thousand tuns of freight, have passed Sioux City, Iowa, this season.—The annual report of the Merrimac Manufacturing Company shows dividends to the amount of 25 per cent, a reserve fund of $515,079 61, and stock on hand $544,248.—During May the aggregate losses in the United States, caused by fire, each involving a loss of at least $20,000, were $2,120,000. The aggregate losses during this year, thus far, have been $16,528,000. From 1859 to 1864 inclusive, the average losses by fire in the United States were about eighteen millions of dollars per annum, while in 1865 they rose to $43 000,000, and in 1866 to $100,000,000. It is supposed that $50,000,000 insurance was paid during the last year for incendiary fires.—Most of the silk manufacturers of New Jersey return no incomes, and the cotton profits are returned very much reduced. At the Clover Hill coal mines, in Virginia, the fire has been extinguished, and the preparations to resume work are being made rapidly—The *Liverpool Albion* says that negotiations are pending for the formation of a new and influential company, with a large capital to run the *Great Eastern* between New York and Brest, in connection with the Paris Exhibition, as it is believed, despite the failure of the first company, there are elements of success in the undertaking.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

CASE FOR HOLDING PRESERVED MEAT AND OTHER SUBSTANCES.—E. C. Dawson. October 12, 1866.—In performing this invention the case is composed of wood, and is lined with plaster of Paris, so as to protect the preserved meat or other substance from the action of the air. After the preserved meat or other substance has been packed in the case, a covering of paper, leaves, or other suitable material is placed over the preserved meat or other substance, and a coating of plaster of Paris, in a state of suitable consistency, is spread over such covering and allowed to set. The lid of the case is then fastened down in the usual manner.

PIPE FOR HOLDING AND SMOKING CIGARS AND TOBACCO.—W. Grune. Oct. 12, 1866. Having discovered that the ammonia vapors evolved when tobacco or cigars are smoked, are capable of reproducing or re-developing silvered photographs on paper, discolored or bleached with chloride of mercury, the inventor has contrived cigar or tobacco holders which will hold the papers so that when the smoke is drawn inwards the ammonia vapors will act upon the paper and cause the photograph to be developed.

APPLYING ENAMEL TO CERTAIN FRICTIONAL SURFACES.—L. R. Bodmer. Oct. 13, 1863. This invention consists in providing those metallic surfaces which are exposed to a rubbing action or friction against leather, as, more especially, the guide bars for the buffalo-hide drivers or pickers, with a covering or coating of enamel, glass, or other vitreous substance, whereby the friction is reduced and the application of a lubricant rendered unnecessary.

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REFINING OR DECOLORISING SUGAR AND SIRUP.—E. Beanes. Oct. 12, 1866. In performing this invention the patentee submits sugar, in a dry or moist state, or in solution, to the action of ozone, either with or without pressure, until the sugar, sirup, molasses, or other saccharine solution is decolorised to the desired point. Pure ozone may be obtained by passing dry oxygen gas through an ozone tube or generator in connection with an induction coil and galvanic battery, or by various other means. The inventor only finds it necessary for his object to pass atmospheric air, by preference previously dried, instead of oxygen, through the ozone pipe or generator, as above explained, and from which the ozone is conveyed by a pipe to a vessel containing the sugar, sirup, molasses, or other saccharine solution to be acted upon.

DETECTING APPARATUS, ETC.—J. E. Buerk. Oct. 12, 1866. This invention consists chiefly in the combination with the ordinary parts of a watch or clock of certain registering devices, which are operated by suitable keys to form impressions or perforations upon dials or indexes of card, paper, or other similar material, the exact time at which each impression is formed being shown by figures or other characters upon the said dial representing the hours and other usual divisions of time.

MEAT CUTTER.—W. M. Miller, Tulpehoccan Pa.—The circular meat block has a rim, and rotates on a vertical axis upon the bench, by means of cogs on its periphery which are engaged by a spiral flange on a drum: this derive its motion by a band from the axis of the wheels whose cogs lift the spring arms; to these are attached the cleavers which cut the meat upon the rotating block beneath.

EVAPORATOR.—Samuel Page, McAllisterville, Pa.—In this evaporator an adjustable plate or bottom is arranged beneath the receiving or skimming pan in such a manner that the heating flue of the latter may be enlarged or controlled so as to increase or diminish the heat as occasion may require. The finishing pan rests upon the walls of a chamber arranged at one side of the main flue, and a novel arrangement of dampers controls the heat within said chamber, or excludes it entirely therefrom, as may be desired.

SHACKLE BLANKS.—J. B. Clark, Plantsville, Conn.—This invention relates to the construction of a carriage shaft shackle from sol blanks, and to the shape of the dies for forming the same, so that with the least amount of labor and power, the said shackle may be gradually formed into the required shape.

VENTILATING FUNNEL.—Frederick Catlin, Watertown, Conn.—This invention consists in connecting the funnel with a stand, and in arranging a valve in its throat, and also providing for thoroughly straining the liquid.

OIL CUP.—T. Lunkenheimer, Cincinnati, Ohio.—This invention consists in the peculiar construction of the cup whereby it is adapted to the use of tallow and other lubricating material, and whereby the chamber which contains the oil or lubricating material, is made air-tight.

MOWING MACHINE.—Caleb Lee, Sandy, Ohio.—This invention relates to important and valuable improvements in mowing machines, and consists in providing a double joint at the forward end of the drag bar in line with the crank shaft. It also consists in the use of a jointed brace, also on line with the crank shaft, and in constructing and locating the crank shaft box so as to strike the frame and cause the outer end of the cutter bar to raise as the elevating lever is forced down, for elevating the same.

SHAFT COUPLING.—N. H. Shaw, Swanton, Vt. Patented May 14, 1867.—The shaft coupling embraced in the present invention, is made in two parts or sections, placed one upon the other and both turning at one end upon one end of the bolt, stirrup or strap, encircling the shaft and forming the means of fastening the coupling thereto; while at other ends between the car pieces at such ends, is hung, by its T-shaped end, the strap or bar secured to the carriage axle, this construction of the coupling enabling the wear of the shaft strap to be compensated for or taken up, from time to time.

GRAIN SIEVE.—H. S. Townsend, Greenvale, Ill.—This invention consists in the application of an additional shoe, outside of and above the ordinary grain shoe of a fanning mill or thrashing machine, whereby the sieve is prolonged, and the grain or seed passed over a larger perforated surface Thereby the complete separation of the fine from the coarse grain or seed will be effected. The invention also consists in the use of strong wire supports, which are arranged under the wire netting, to keep the same flat, and prevent it from sacking.

HAY GATHERER.—J. F. Swinnerton, Marion, Ohio.—This invention has for its object to furnish a machine for hauling and delivering hay at a stack, simple and durable in construction, easily operated, and which will take the hay from a windrow, rendering the labor of previously cocking it wholly unnecessary.

ELEVATED STREET RAILWAY.—F. A. Williams, Clovesville, N. Y.—This invention relates to a new and useful improvement in elevated street railways its object being to so arrange and construct the posts or pillars, by which the rails are supported, that they do not occupy more space on the sidewalk of the street and are in no manner more inconvenient, than the common lamp posts; so that a railway constructed on this improved plan would be no inconvenience to the pedestrians on the side walks or to the vehicles on the street.

PLANTING HOE.—Augustus Williams, Sebec, Me.—This invention relates to a new and improved method of depositing seeds in the ground, and covering the same.

STEAM BOILER.—Henry McDonough, N. Y.—This invention consists in the arrangement of valves at the ends of a tubular steam boiler in such a manner that the heated gases and products of combustion are retarded and detained in their passage to the chimney, and thereby compelled to part with their caloric.

FRUIT AND POULTRY BOXES.—D. B. Spinning, Brooklyn, N. Y.—This invention relates to a novel manner of constructing boxes of that kind, which are used for transporting fruit, poultry, vegetables or other articles to market, and which are so arranged, that they can be folded together, when to be transported back, empty to the farms or places, whence they were sent. Although these boxes will be slightly more expensive to construct, than those now in use, the reduction of return freight will, it is claimed, in a few trips, more than twice repay the difference.

MACHINE FOR MAKING BUTT HINGES.—Adrian Rais, Waterbury, Conn.—This invention relates to an improvement in machinery for bending the knuckles of butt hinges, by means of a single die at one operation, instead of two distinct operations with separate dies, thereby simplifying the mechanism and manufacturing hinges more rapidly and economically.

AMALGAMATOR.—J. B. Forissier, New York City.—This invention relates to an amalgamating apparatus in which several baths of mercury are employed in order to obtain a large area of amalgamation. This object is obtained by arranging in an upright cylinder a series of stationary annular pans between which a series of revolving annular pans are arranged; each of the pans containing mercury, and the water with the ore falling from one pan to another. The water falls alternately from the center of the stationary pans, and from the circumference of the revolving pans upon the pan below, thus passing in a zig-zag line from top to bottom of the apparatus, and comes in contact with the whole surface of the mercury in each pan, thereby striking a larger area of mercury than is done by any apparatus now made.

WASHING MACHINE.—M. McEnerney, Birmingham, Ct.—This invention consists in a machine for washing clothes, rags, etc., by means of two circular corrugated plates or disks, between which the clothes are placed, said plates or disks being arranged and hung so that the one can be revolved, and in contact with the other, which is stationary, and thereby produce the desired rubbing or scouring of the clothes.

PILL MACHINE.—W. V. V. Wilson, Savannah, Ga.—This invention consists in the arrangement of adjustable rails on the sides of the board of a pill machine, in such a manner that said rails can be raised or lowered to correspond to the diameter of the pills to be produced, whereby the rolling of the dough is materially facilitated.

SHEEP FEED RACK.—Joel J. Smith, Barnesville, Ohio.—This invention relates to a sheep rack and feeding trough combined in such a way as to facilitate the feeding and economize the feed, and consists of a rectangular box perforated to admit the sheeps' head. The bottom consists of a pair of doors turning on pivots, for convenience in clearing out the rack. The troughs are inside the rack, and when feeding rest upon the bottom, but when not in use are elevated out of the way by a simple lever arrangement by which they are carried into a position just over the perforations in the rack, and beneath two pivoted shields which serve to protect the troughs and the feed and prevent the latter from being spilled when being placed in the troughs.

CASTER.—James T. Barnes, Hudson City, N. J.—This invention relates to a new and useful improvement in a caster, for which Letters Patent were granted to this inventor, bearing date Oct. 30, 1866. The invention consists in having the shank of the caster at one side of the axis of the wheels, whereby the caster is allowed to turn, so that the wheels, when the article to which they are applied is moved, may adjust themselves in line with the movement of the article. The invention also consists in a novel manner of securing the metal socket or sheath in which the shank of the caster is fitted, in the leg or bottom of the article to which the caster is applied, whereby the socket or sheath may be secured in the leg or bottom of the article with the greatest facility.

TOILET GLASS.—Albert Ober, Beverly, Mass.—This invention relates to a new and improved toilet glass, whereby the back part of the head may be seen. The invention is more especially designed for the use of ladies to aid them in arranging and adjusting the hair at the back of the head. The invention consists substantially of two mirrors, one of which is hung on pivots in a frame, and the latter connected by hinges or joint to a series of frames also connected by hinges, and the outer frame of the series provided with a mirror; all being so arranged that the two mirrors may be adjusted in such relation with each other, that a lady, for instance, by looking into the mirror which is hung on pivots, may see distinctly the back of her head, and be enabled to arrange, adjust, or dress her hair on that portion of her head with the greatest facility.

WIRE FENCE.—Lucien B. Smith, Kent, Ohio.—This invention relates to an improvement in the construction of a wire fence, especially adapted to use in the prairies of the Western States where timber is scarce, and fires frequently sweep over them, destroying every thing that is combustible.

TABLE.—H. C. Hardey, Muncie, Ind.—This invention relates to a new and useful contrivance for aiding in raising and lowering the leaves of an ordinary dining table, and consists in connecting weights to hang under the bed of the table, with the sliding supports usually employed to hold the leaves when they are raised, which weights draw upon the supports at the time the leaves are raised, and throw them out under the leaves to support them.

SAW MILL.—Joseph Hubbell, Zanesville, Ohio.—This invention relates to new and useful improvements in saw mills, and consists in devices and arrangements for operating the head blocks, and setting the logs for a saw with perfect accuracy, to cut boards of uniform thickness.

CULTIVATOR AND COTTON PLANT THINNER.—Geo. W. Chambers and Isham Washam, Talladega, Ala.—This invention relates to an improved machine for thinning and cultivating cotton plants.

PROCESS FOR EXTRACTING AND SEPARATING GREASE AND OILS FROM ANIMAL AND VEGETABLE SUBSTANCES.—Joseph Besso, Philadelphia, Pa.—This invention relates to an improved process for separating and extracting the oils and fatty matters contained in unwashed wool, bones, oil cake, seeds, or other animal and vegetable substances, whereby wool especially is thoroughly cleansed and purified, and the oil it may contain is separated and utilized with great economy, instead of being wasted and lost at great cost in the ordinary method of washing and cleansing wool with soap.

CONFECTION.—E. C. Maltby and Edward Smith, Northford, Conn.—This invention consists in preparing the meat of the cocoanut so that the same may be preserved and kept an indefinite period, and used at any time.

TRAM AND SELF-CENTERING DISH STAFF.—Samuel Mills and J. R. McIrvin, Clinton, Ill.—This invention relates to a new and useful implement or device for centering hubs and scribing the circumference of wheels, and also for dishing wheels, which implement I term a tram and self-centering dish staff, and by which wheels of any desired size may be scribed precisely from the centre of the hub and the exact dish given a wheel as may be required.

ANTI-COLLISION AND CODE SIGNAL LAMP.—Joseph Wall, New York City.—This invention relates to a new and improved anti-collision and code signal lamp, adapted for vessels at sea to prevent collisions; and affords a complete method of communicating information of any description between vessels at night.

SHEEP RACK.—John D. Munson, Tyre, N. Y.—This invention has for its object to furnish a simple and convenient rack for feeding sheep with hay or grain, and which can be readily taken apart for storage.

FRAME FOR STRETCHING WET LEATHER.—Ichabod W. Dawson, Newark, N. J.—This invention has for its object to furnish an improved frame upon which hides may be extended for drying, which shall be so constructed that the hides after being extended upon the frame, may be stretched so as to bring out all the wrinkles, folds, etc., leaving the surface of the leather smooth and better prepared for the subsequent operations.

GATE.—J. B. Powell and S. H. Everett, Macedon, N. Y.—This invention has for its object to furnish an improved gate, so constructed and arranged that it may be opened or closed by the driver without getting out of the carriage.

SULKY PLOW.—Israel Wing, Earlville, Iowa.—This invention has for its object to furnish an improved sulky plow, so constructed as to be easily operated, and the plows of which can be easily brought nearer together or spread further apart as may be required.

POTATO DIGGER.—Joel E. Giles and Charles S. McRobert, Meads Mills, Mich.—This invention has for its object to furnish an improved machine, by means of which potatoes may be readily and conveniently dug and separated from the soil raised with and adhering to them.

EXTENSION STEP LADDER.—Henry T. Smith, Brooklyn, N. Y.—This invention has for its object to furnish an improved step ladder, so constructed and arranged that it may be extended as desired to adapt it for use in rooms with different hight of ceiling, and so that one part may be extended independently of the other to adapt it for use upon a stairway.

GUIDE FOR CARDING MACHINES.—F. W. Albertine and E. T. Albertine, Hanover, Conn.—This invention has for its object to furnish an improved guide for carding machines, by the use of which the carding will necessarily be done all over the cylinder, so that the tumbler, cylinder, and fancy, will be worn even, and not in creases, rendering it unnecessary to grind so often, wearing the carding clothing evenly, and doing better work.

MACHINE FOR SOFTENING OR DRESSING LEATHER OR SKINS.—F. J. Burcham, Racine, Wis.—This invention has for its object to furnish a convenient and effective machine for softening or dressing leather, particularly buckskins, calf-skins, kid, etc., but equally applicable to other kinds of skins, whether having the hair on or off.

SHOVEL PLOW.—Daniel Gilbert, Carbondale, Ill.—This invention has for its object to so improve the construction of shovel plows as to increase their strength and steadiness in working, and so as to adapt them to all kinds of work.

MACHINE FOR UNHAIRING HIDES.—Judson Schultz, Ellenville, N. Y.—This invention has for its object to furnish an improved machine, by means of which hides may be unhaired, and leather scrubbed, scoured, or washed conveniently, thoroughly, and rapidly.

MACHINE FOR UNHAIRING HIDES.—Elias Brock, Ellenville, N. Y.—This invention has for its object to furnish an improved machine for unhairing hides, and scrubbing, scouring, and washing leather conveniently, rapidly, and thoroughly.

WASHING MACHINE.—James M. Noble, Delhi, Iowa.—This invention has for its object to furnish an improved washing machine, simple in construction and operation, not liable to get out of order, and combining within itself many of the utensils ordinarily employed in washing clothes.

HANDLE ATTACHMENT FOR BLACKING BOXES.—Thomas S. Robinson, New York City.—This invention is designed to supersede the different holders now manufactured to receive and hold blacking boxes while the same are being used, the holder serving as a handle for the box, and preventing the hand of the operator being soiled by the blacking while charging the brush with the same.

WRENCH.—J. V. H. Secor, New York City.—This invention relates to a new and improved wrench of that class which are provided with a sliding jaw, and it consists in a novel manner of applying the sliding jaw to the shank of the wrench, whereby the former may be readily moved on the shank and adjusted to the nut to be turned, and firmly secured in position, after being thus adjusted, and while operating upon and turning the nut.

BACK SAW.—Edward H. Roe, Jersey City, N. J.—This invention relates to a new and useful improvement in what are commonly termed by joiners back saws, and has for its object the straining, by a simple means, of the saw plate whenever the same becomes bent or "kinked," as it is technically termed, so that it may be brought in a plane and have a straight cutting edge, or one free from lateral bends or kinks. These back saws have their plates, as they are used for fine work, the cutting of tenons, etc., and the plates are consequently very liable to become bent or kinked, so much so as to frequently render it difficult to use them and make a smooth kerf or cut.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisemets at 50 cents a line, under the head of "Business and Personal."

F. A. W., of Miss.—Supposes that the moon's atmosphere presses on the earth's atmosphere, and hence the tides, etc. etc.

E. J. B., of Wis.—"Why is it that an apple scion, produces fruit of its own kind when grafted into a stock of far different and inferior quality? I do not assume to know anything about it, but would like to understand it." So would we.

C. M. S., of N. Y.—To make whitewash which will not rub off, add to it a little sugar or molasses.

F. F. L., of Pa, has failed lately to get a japan varnish for small articles of iron which gives a good gloss. He ought to try another brand of varnish or manufacture for himself.

G. A. S., of Mass.—Shellac and rubber have the property of toughening fusible cements, also they render them less fluid when melted. We cannot answer you more definitely until you give us farther details of the use of the cement.

J. W., of N. Y.—The questions you send belong to ordinary mensuration and we refer you to any good treatise on arithmetic for their solution.

R. B. N., of Me.—The simplest way to determine the hardness of water, is to observe its effect on soap. The soap test is in fact generally used by chemists. The solid contents of hard water are left on complete evaporation of the water.

T. R., of N. Y.—We do not understand the construction of pegging machines sufficiently to explain the method of finishing the cams. . . Jessop's, or Sanderson's are excellent brands of tool steel. Some American steel is also recommended. . . A set of ten taps such as you desire from one quarter to one and a half inches, is worth six or seven dollars.

E. C. H., of N. H.—The iron pavement you speak of as having been used in Court street, Boston, has been tried here, and remains of it are still to be seen in Cortlandt street, this city. It is not satisfactory, being displaced easily and breaking. We do not think your plan of making the sections of extremely hard iron would improve it.

E. W. N., of Mass.—Your rule for ascertaining the area of a circle where diameter and circumference are known, by multiplying one half the diameter of the circumference by one-half the diameter is only another way of stating the rule given by Rowland Hill on page 376, of No. 24, Vol. XVI. Either of them are sufficiently correct for ordinary practical purposes.

H. M. C., of Pa.—This correspondent wishes to drive a circular saw by one man's power which requires four horse power now to drive it! He proposes a wooden fly wheel 30 feet in diameter having on its shaft a pulley to run the saw, and asks if he can *gain* the necessary power by turning the concern with a crank by the hands of one man. We reply by asking another question: If *power* can be gained by the use of a fly wheel where is the limit, and what is the necessity of steam power for any purpose?

J. C. S., of Iowa.—Of course it is the duty of steamboat men as pilots, engineers, etc., to inform themselves as to the laws that govern steam vessels. We have no space to publish the laws on this subject; they may be found in the proper official documents.

W. H. H. H., of Pa.—If we understand your query it is this, when simplified: "Can I get more power to overcome obstructions—as unevenness of surface on land—with a traction engine, double cylinders, 7-inch diameter, 100 lbs. pressure, 135 strokes per minute, by gearing down to 15 revolutions (1-9 on the main shaft of my machine, than I could by using a cylinder of nine times the area—nearly 21 inches—same length of stroke, pressure of steam, etc., and attaching connections directly to cranks on the machine shaft, which must, of course, make only fifteen turns per minute." We reply that for the purpose intended—a "plowing machine"—we think your swiftly running engine, if properly connected would be better adapted to the work, as you would gain momentum of the driving parts to assist in surmounting occasional obstacles.

J. B. R., of Pa., says he was on board the U. S. sloop of war *Dale* in 1857 and that it was a common practice to rub a greasy rag around the muzzle of the guns before firing salutes, in order to secure well formed smoke rings. The greasing process was very effective and certain

L. G. G., of N. C.—The mineral sent by you is iron pyrites. The pyrites of your State always contains gold.

T. M. Jr., of O.—The popping of corn is explained by the expansion of air or gas contained within the kennel; it is a case of explosion. The substance of the kernel at the instant of the explosion appears to be tough and plastic.

Business and Personal.

The charge for insertion under this head is 50 cents a line.

Wanted—Parties to engage in all kinds of manufacturing at Coloma, Ill. See advertisement and address A. P. Smith, Sterling, Ill.

Publishers of Weekly Newspapers send specimen copies with advertising terms to Joel K. Reiner, Line Lexington, Pa.

For Sale Cheap—One French Pin-escapement Regulator and a small Foot Lathe. Address James H. Flynt, Shelby, Ohio.

The United States Patent Office issued, among other Letters Patent for Sewing Machines to JOSEPH W. BARTLETT *two* patents for "*new* and useful designs for sewing machines" One of these patents is for a *circular form*, the same as that FIRST used in the Bartlett Machines, the other for an elongated long arm form, it being found that this latter form possessed *advantages over* the CIRCULAR form, giving greater space to the "work," etc., and from a similarity of the Bartlett patent CIRCULAR form to that of the Willcox & Gibbs. Mr. Bartlett, therefore, being desirous to give as distinct a character as possible in the best form to his machines, determined, some fifteen months ago, to adopt the use of the "long arm" form, caused the models to be made and their manufacture begun. They are to be seen at the General Office, No. 569 Broadway, New York City. SEE ILLUSTRATION OF THE MACHINE IN "HARPER'S WEEKLY," July 6.

J. W. Bartlett:—DEAR SIR: At your request we state that the suits brought by us was only to prevent the use of the letter "G" form, and does not affect or interfere with your right to make or sell Sewing Machines in the form patented by you published in the SCIENTIFIC AMERICAN Nov. 18, 1865.

Signed WILLCOX & GIBBS S. M. CO.

NEW YORK, June 3, 1867.

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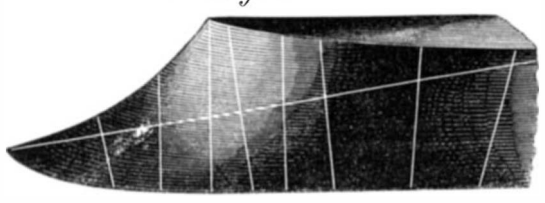
Improved Plow Mold Boards.

The advantages claimed for this plow over others is a diminution of side draft, a lessening of friction, and an ease of manipulation, derived from the fact that its construction is based upon fixed and correct mechanical and geometrical principles. The surface of the mold board is laid out with square and compass, every line bearing its exact proportion to any other at every other point. The surface of the mold is really an inclined plane, curved, with no abrupt turns nor side friction.

Fig. 1 is a perspective view of the plow and shows merely its general appearance and not its special and distinctive characteristics; these are seen in the diagram marked Fig. 2. The diagonal longitudinal line across its face, from lower point to upper, is a right line on which a straight edge bears perfectly the whole of its length. The cross lines present also a perfect surface from the base upward. By placing one angle of a square on the base of the block from which this diagram is taken, and moving forward the block, turning it as moved, the tongue or other angle of the square will engage with the whole surface, point by point, in succession. Of course it will be seen that the face of the mold is a true inclined plane, curving like the movement of a spiral or screw. Thus the soil is not crushed against the mold board, bent nor strained, but slides gradually up the incline to a perpendicular, when a slight outward projection of the upper rear portion of mold board inclines it to the outer side and it falls by its own weight.

It must be evident that heavy, stiff soils can be worked with great ease by a plow designed on these plain geometrical principles, and experience has proved that this plow is an exceedingly easy working one. The soil will not adhere to the mold board, and, as the plow itself is parallel with the beam and not at an angle, the side draft is reduced to its minimum.

Fig. 2



Patented Oct. 30, 1866, by L. P. Rider. For further particulars address Moseley, Rahm, & Co., the owners of the patent and manufacturers of the plow, Pittsburgh, Pa. The right for the Eastern States for sale.

Purification of Polluted Waters.

Pulverized charcoal has always been recognized as furnishing a most valuable filter for clarifying water containing organic or inorganic substances. A paper was recently read before the London Institute of Civil Engineers embodying the results of a number of carefully conducted experiments made for the purpose of definitely determining just how far the statements made regarding the action of this substance in purifying water, might be depended on.

The details of four sets of experiments were given, the first on animal charcoal, of which nearly 5 lbs. new and freshly burned, and of the degree of fineness used in sugar refineries, were packed in an ordinary stoneware filter. The water employed (of which a complete analysis was given) contained, in the gallon, organic matter, 10.80 grains; inorganic matter, 88·30 grains. The hardness of the water, before boiling was found to be 50·50°, and after boiling, 33°; and the oxygen required to oxidize the organic matter contained in in one gallon, amounted to 0.0116th. part of a grain. Several gallons of the water were allowed to percolate slowly through this charcoal, and upon examination afterwards, it was found that, of the inorganic matter which had originally existed, 52·60 grains were removed from the first gallon; but from each succeeding gallon less and less; so that from the twelfth gallon of water that passed through the charcoal only 8·80 grains of inorganic matter were removed. Of the organic matter 4·80 grains were removed from the first gallon; but, with a gradual decrease, the charcoal ceased to remove any organic matter after the sixth gallon. In fact, immediately afterward, it commenced to give back a portion of the organic matter removed in the first instance, the quantity returned to the twelfth gallon amounting to 1·55 grains. Thus, of the 13·54 grains of organic matter removed by the charcoal from the first six gallons of water, as much as 4·98 grains were given back to the next six gallons; from which the author concluded that, had this set of experiments been carried a little further, all the organic matter removed at first by the charcoal would have been given back again.

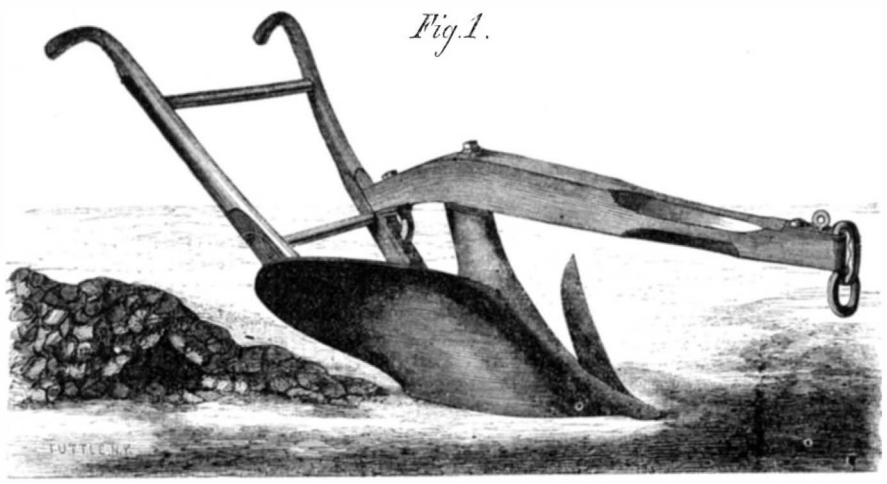
The second and third series of experiments were with wood and peat charcoal, which, however, were still less satisfactory than those with animal charcoal. The fourth set of experiments was on animal charcoal, with water previously treated with permanganate of potash slightly in excess. After remarking that the water, in its passage through the charcoal, was found to contain organic matter, apparently in the same quantity as before treating it with the permanganate, attention was drawn to a comparison between the first and fourth sets of experiments, to show how closely they agreed to contradict the general statements made as to the removing power of charcoal, and to demonstrate how very little indeed could be done by this filtering material, even on a small scale, toward the purification of water.

The author in conclusion gave it as his opinion that, as by chemical agency bad water could be purified to a very limited extent only, the public mind should more than ever be given to the great question of supply; and as people valued their lives, they should above all things, in their choice of a source, not be too much influenced by distance, but be willing to undergo the necessary expense of securing the object of their search, not only in abundance but in the greatest purity.

Combined Wood and Iron Pavement.

J. B. S. proposes a street pavement composed of square blocks of wood put together in sections on a frame of cast iron which extends about half way up the sides of the blocks; these sections to be prepared at the manufactory in sizes to suit and transported to the place where they are to be laid. He would use resinous wood or wood kyanized, uniting the joints with resinous matter. We see no real advantage in the use of the iron. Already sections of wooden pavement are made in a manner similar to that proposed, except that no iron is employed.

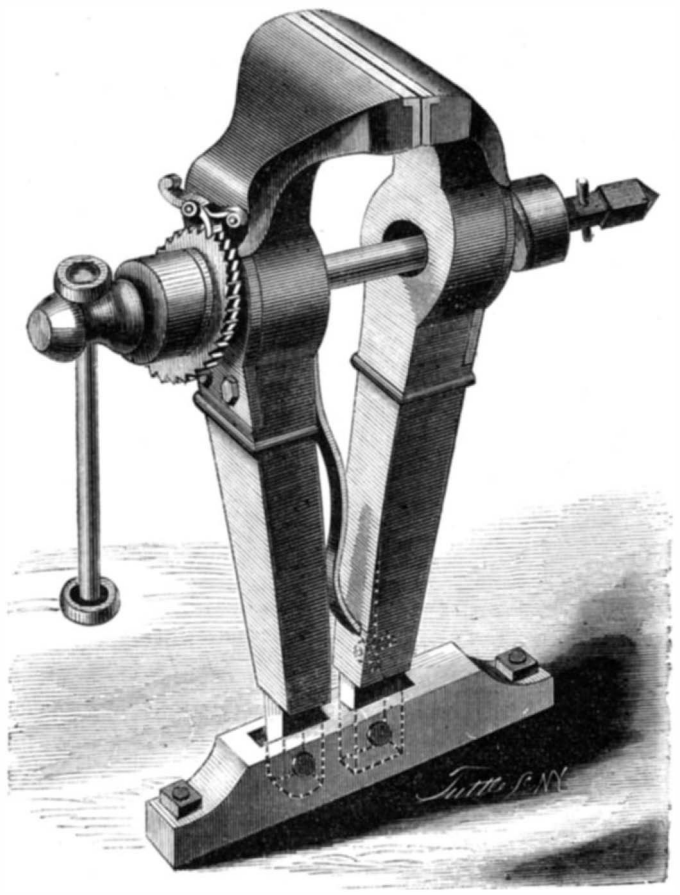
Fig. 1.



RIDER'S GEOMETRICAL PLOW.

Improved Device for Working Vise Jaws.

The object of this device is the quick opening and closing of the jaws of vises, as in no case is it necessary to turn the handle lever more than half around. In place of the screw and sheath, a bar passes through the jaws, the apertures being large enough to allow of the reciprocating movement of the jaws. On each end of the bar, outside the jaws, is fixed a disk having an inclined face, that is a disk one edge of which is much thicker than the other, working against steel faces on the outside of the jaws.



RALSTON'S DEVICE FOR CLOSING VISE JAWS.

It will be seen that as the bar with the disks is turned in one direction the spring will force the jaws apart, and if in the other direction they will be closed firmly. Attached to one of the disks is a ratchet wheel, which by means of a spring pawl secured to the vise, is held in any position. Thus the jaws can be secured to suit the thickness of the article held between them. The back disk may be moved upon the bar to allow the vise to open more or less, and held by a pin passing through the bar. The foot also of the movable jaw can be set by changing its pivot to other holes in the base. Not only can it be closed firmly by a single half turn of the ratchet, but it can be instantly opened by merely pressing down the pawl of the ratchet with the thumb or finger, and it can be worked by either hand or foot. It is impossible for it to give away, and loosen its grasp upon the work, like a screw vise, either from hammering, jarring, or any other incidental cause. The same vise is applicable alike to all kinds of work, whether heavy or light. The extent of its grasp is limited only by the length of the rod which passes through the cam disks, and by which the power is applied.

A patent was obtained for this improvement through the Scientific American Patent Agency Jan. 22, 1867, by James S. Ralston. For further particulars address Carter & Ralston, Indiana, Pa.

Platinizing Metals.

Platinum has been formed into coins, etc., by subjecting it in fine powder as obtained by chemical treatment, to powerful pressure. It may now be melted and cast by the oxygen furnace referred to in another paragraph. There is also a method newly published, for coating other metals with a delicate film of platinum, and thus endowing them for practical purposes, with some of its most valuable properties. It is dissolved in nitro-muriatic acid, or aqua regia, forming bichloride of platinum. Of this, 60 grains are to be dissolved in one ounce of distilled water, with an equal weight of pure honey. Add ¾ oz. spirit of wine, and ¼ oz. ether, and filter the solution, if necessary, quite clear. The metallic surface to be platinized is first washed with soda and then with water, dried and finally heated not quite to redness, and plunged for a minute into the solution above described. The color of the platinum film is a neutral grayish black, sometimes showing a faint iridescence. Gold and silver are not affected by the process.

Eating Without Hunger.

This is a very foolish and injurious habit, one which almost every one is more or less subject to. Hunger is the signal which nature gives to indicate the necessity for a supply of food. When the system requires food and is in a condition to make good use of it, it will call for it in its legitimate way. There are some exceptions to this rule in certain diseased conditions, but they are very few. The digestive organs are in the best possible condition for digesting food when the sensation of hunger exists, and they can then do it far more easily, thoroughly, quickly, and with less effort than at any other time. Most people pay little attention to this; they are sure to eat whenever they are hungry, if it is so that they can, and they are just about as apt to eat when they are not, if it is convenient for them to do so or they chance to see anything which "tickles their palate." Especially is this rule—never eat unless you are hungry—violated in sickness. In acute disturbances of the system the sensation of hunger is seldom manifested for the simple reason that the system does not require food. If food is eaten at such times, as it usually is, for everybody thinks the patient will surely starve if he does not eat just so much and so often, it becomes a burden to the system which must be got rid of, for there is no use for it, and, as it will not do to let it remain in the stomach, the vital powers, which are engaged in the reparative process termed disease, are called from the work upon which they are engaged to remove the substances which are creating the disturbance. The result is that the reparative process is partially or wholly suspended; fresh operation, and a longer time will be required, (for causes of disease are added to those already in the remedial powers,) to repair damages and set the vital machinery in proper and harmonious action. Thousands of persons have been prematurely laid in their graves simply from eating heartily when the system was not in a condition to properly digest and appropriate the food. Let this rule be observed by those who desire health with all the untold blessings which always accompany it: whether sick or well, do not force food into the stomach unless there is a demand for it. No fears need be entertained of starving, for a desire for food will be manifested long before the starvation point is reached.—*Journal of Physical Culture.*

REMARKS.—Many of the "ills that flesh is heir to" are doubtless caused by over indulgence at the flesh pots. But it is questionable whether the rule of "eating when you are hungry," is the best that can be adopted. If carried into practice would it not lead to frequency, absurdity, and irregularity of meals? Would it be wise, even if you are hungry, to dine at bed-time, or breakfast whenever you happened to wake in the night? Does not experience prove that the golden rule of diet consists in regularity of hours, moderation in quantity, careful choice of edibles, complete mastication of the food?

ADJUSTABLE HANGER.—In our description of the adjustable hanger, in No. 25. Vol. XVI., the device was credited to M. T. Davidson, 84 John street, this city, who are only the agents for its sale. The patent is owned and the hangers manufactured by the American Tool and Machine Co., Boston.

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PERSISTENCE THE ESSENTIAL ELEMENT OF SUCCESS.

How many projects calculated for the improvement of the race have been suffered to die, after receiving shape and form, will probably never be known. There are many really inventive minds which possess no quality of perseverance. They nurse the germ of a discovery or improvement into vitality until it promises to arrive at a useful maturity, and then, apparently without reason, let it die a natural or an unnatural death, without serving any useful purpose whatever. Unable to rest, they immediately conceive another idea, which in its turn is stillborn or dies in immaturity. The lack of adequate return for the labor and mind employed in these cases is not because the improvement itself is not valuable, nor because the inventor wanted confidence in its merits; it is wholly because he lacked persistence of purpose. Frequently the invention is re-invented, the improvement re-discovered, and the original discoverer sees the product of his own brain which he himself neglected, enriching and benefiting others. Where one man with energy, perseverance, persistence in overcoming obstacles, and well directed endeavor, will succeed with a comparatively unimportant and trifling invention, another with one of general usefulness and great intrinsic value will never realize either wealth or fame.

He who merely conceives an idea and thinks about it, but makes no attempt to bring it to the notice of others and to introduce it into the living, breathing world, has no right to claim any credit or reward if afterward another shall utilize what he merely dreamed about. Not that success alone should be the measure of estimation for a well directed attempt; for many who have not succeeded themselves have opened the path and pointed the way for others. Such should and do receive the credit due to their endeavors. But the possessor of a useful idea who selfishly keeps it as a plaything for his leisure hours, as a hobby on which to ride, or neglects to develope it into activity, can claim nothing justly of him who gave it life and purpose.

The career of Cyrus W. Field in his thirteen years of labor on the Atlantic cable is an illustration of the value of persistency. He, a retired merchant, peacefully settled, as he believed, for the remainder of his life, determined to attempt the great enterprise, and enlisted by his enthusiasm some other gentlemen in the project. A land line of four hundred miles with a good bridle path had first to be constructed through the wilderness of Newfoundland. This employed a force of six hundred men for two years. Then a submarine line had to be laid across the Gulf of St. Lawrence. This was once lost and had to be replaced. Then the great Atlantic line was four times broken, but amid all these discouragements, seeing his own fortune and those of others literally "cast into the sea," subjected to the discomforts of over thirty Atlantic voyages, and enduring the annoyances of loudly expressed unbelief and illy concealed ridicule, he persisted until his proudest monument is his success in the laying of the great ocean telegraph.

If the inventor has discovered a really good thing, or the mechanic made an indisputable improvement, there is no adequate reason for discouragement if the world does not at once accept his view of it. If it has merits and they are persistently and continually presented in the proper manner, it is impossible but they will attract attention. If, however, the inventor is satisfied with having perfected his improvement, and does not follow up this success by further attempts in properly introducing it, he may as well give up the career of a successful inventor. There must be persistence: first in working out into active form and palpable shape the idea; then there must be the same persistence in presenting it to the attention of others, whatever may be the discouragements and rebuffs which meet him. Without this quality the inventor is useless to others and powerless to aid himself; with it, to him all things are possible.

RIGHTS OF PROPERTY IN INVENTIONS.

"The large share which the inventions of Americans have had in promoting industrial progress throughout the world, renders the degree of effective protection given to inventors in the United States and other countries, a subject of pressing importance. It is not merely that the spirit of invention is aided just in the degree that encouragement is given to the inventor, but that any country desirous of maintaining her superiority over other countries, will find that the utmost liberality in giving effective protection is coincident with the soundest policy. If France, for instance, were to do for other branches of industry what it has already done for its art-industry, insure to the inventor a property in his invention in perpetuity: and the patent laws of England at the same time to remain unchanged, it would certainly happen in no long period of time that England would be unable to compete with France in the very commodities in which at the present time she has the indubitable superiority. By giving perpetuity to inventions, England, on the other hand, besides giving a stimulus to the national talent, would attract thousands of foreign inventions, now kept back by fees unreasonably high, taken in connection with the limitation of time during which a patent is valid. So long as England alone possessed a patent law, this law, imperfect as it was, produced a beneficial result to her advantage as compared with other countries, but so soon as other nations adopted similar, or even better laws, the patent regulations in England should have been more completely amended. On comparing the condition of industry in different nations with each other, we find that in proportion to the length of time encouragement has been given to the inventor, and to the liberality and effectiveness of the laws affording protection, the industry of such nation has progressed. Turkey, Persia, and China are without patent laws, and the industry of these countries is, as a natural consequence, very nearly in the same state it was two or three centuries ago, when England was politic enough to attract by the promise of property in inventions, the inventors of the whole world to develop their ideas on English soil."—*London American.*

REMARKS.—The writer thinks that patents, instead of being granted for a limited term, should be made perpetual. This would be convenient for patentees, and encouraging to that large class known as assignees, who generally purchase the patent from the poor inventor for little or nothing, and then grow rich by taxing the public.

The European masses have for centuries been ground down by monopolies. By means of patents for special privileges, taxes, imposts, and various legal devices, the lords, dukes, and other monopolists, have maintained a perpetual system of robbery and oppression upon the working classes, the baneful influences of which language is inadequate to describe.

If patents were made perpetual, a patent aristocracy would quickly spring up to revel upon the industries of this republican nation.

The aim of law is to benefit the whole people. Laws which burden the masses but fatten the few, are bad in principle, and should never be perpetuated.

Every citizen is bound to labor for the common good; and some philosophers say that the just reward for labor should be in accordance with the prices of bread and the severity of the work done; he to whom brain work is most suitable, receiving no more pay for eight hours' labor, than the man of muscle for the same period. But we do not endorse this theory. If patents were paid for on this principle, some of the poorest inventions would bring high prices, and some of the best only a trifle.

The object of the patent law is to benefit the people by putting them in possession of improved tools, machines, appliances, processes, and other agencies by which industry is assisted, intelligence promoted, and the comforts of life augmented. The law encourages inventors to make known their improvements by giving them brief monopolies and permitting them to tax the people. When the patent expires, the monopoly ends and the people come into free possession of the improvement.

We believe in the expediency of patent laws, but we think the world could revolve without them. We have been accustomed to attribute the stagnation of the Orientals to ignorance of revealed religion and lack of moral power. Our cotemporary thinks it is due to want of patent monopolies. True, the Celestials have no patent law, but the Chinese compass guides our patent ships, and Chinese powder thunders from our patent guns. Many of the most marvelous discoveries were achieved without the help of patent laws.—[EDS. SCI. AM.

SOURCES OF NATIONAL IMPORTANCE.

Neither extent of territory nor strength of armies and navies, alone constitute the power of nations; nor even the possession of vast deposits of the precious metals, although each of them under favorable circumstances may contribute to national importance. More important than either of these however, is population. The British empire, with an area of 3,555,092 square miles, has a population of 223,500,000. Russia with an area of 8,281,000, has 74,000,000 population. France, 546,000 square miles and a population of 44,000,000. The United States 2,819,811 square miles exclusive of Walrussia and a population of about 33,000,000. England's preeminent importance and influence is largely a consequence of the great population she controls, and the diversity of their productions. The people of every variety of climate and soil contribute to her wealth and add to her power. Outside of herself and her colonies she really requires nothing necessary to contribute to her ascendency; the resources of a world are virtually her own. Her colonies furnish her with all manner of useful material, which she manufactures and returns to them and sells to the world, while the islands known as Great Britain and her North American colonies supply food for her mechanics. Every essential element of prosperity, so far as material needs are concerned, she possesses to a greater extent than any other European nation. The main drawbacks to this independence are the wide separation of the parts of her empire and the difference in the language and customs of her people.

In these respects we excel her. Our territory is embraced in a single boundary line, and our people speak a common language. Our productions are those of the north temperate, temperate, south temperate, and torrid zones, and of every diversity of soil, situation, and climate. Our country contains every kind of metal and mineral, many varieties of useful timber, the best grain-growing lands on the globe, and a greater number of valuable manufacturing material than any other, except, perhaps, that of the British empire. Our population is increasing faster than that of any other country, and our institutions are not only liberal, but alike from one end of the country to another. Possessing these present and prospective advantages, it is difficult to conceive a limit to the future importance of the United States among the nations.

MALLEABLE CAST IRON.

For some reason, not fully clear to us, malleable cast iron has not assumed the position among the useful metals it is entitled to from its merits. There appears to be a prejudice against its use which arises from a doubt as to its strength. For resisting a transverse or a longitudinal strain it may not be equal to wrought iron in tenacity, nor to cast iron in rigidity, but in some situations it is actually superior to either wrought or cast iron and in some respects better than steel.

If cast from the proper metal and then properly annealed and softened by the process of semi-fusion, it is more homogeneous than either ordinary cast iron or steel. When these conditions exist it may even be forged and drawn under the hammer without crumbling; its tenacity is wonderful under some circumstances. The carbon is almost entirely abstracted, reducing it to the condition of nearly pure iron without, however, the fiber of wrought iron produced by hammering or rolling, which fibrous condition is sometimes an element of weakness: for instance a small gear with a large hole upon which a great strain comes, has been proved to be much stronger made of cast malleable iron than of wrought iron or steel.

A case came under our observation some years ago, where the spindle gear of a screw-cutting lathe containing only 20 teeth was broken. Between the bottom of the teeth and the hole for the spindle, the metal was less that one quarter of an inch thick. The ordinary cast iron gears would fly in pieces whenever the carriage was reversed. A blank was forged of a bar of tough wrought iron, turned into a ring and welded with a scarf weld. Of course the fiber or grain of the iron followed the circumference, and the vertical sections of the teeth were cut through it. This gear would not stand. Cast steel gears, both annealed and hardened, were tested and failed, when a gear was cast and made malleable and worked satisfactorily for many months. In another instance the wheels for a wringing machine, which connected the rollers, could not be made to stand when of ordinary cast iron. They were made of cast malleable iron and no after trouble was experienced.

It is poor economy to employ a cheaper material merely because it is cheap; but when cheapness and superiority may be combined, as is the fact with malleable iron in many cases, it is the part of wisdom to do so. It can not be doubted that malleable iron may be used for many purposes to which wrought iron and steel are now applied.

PRACTICAL MECHANICS AS VISITORS TO THE GREAT EXPOSITION.

A correspondent, alluding to the raising of funds in England to pay the expenses of practical workmen to the Paris Exposition, inquires why a similar movement here might not be feasible and advantageous. In our opinion, there is little in common between the two cases. First, England is separated from France by a very little distance and a very brief time. To go from New York to Chicago, or from New York to Boston by steamer and rail, is a much longer and full as difficult and dangerous jaunt; we are not certain but it costs more money. Compared with the trip from any part of England to Paris, a journey from this country to the same place, even if the start is made from New York or Boston, is a great undertaking.

Second, we do not think the same conditions exist in relato the requirements of the parties. A very large proportion of our employers of mechanics are themselves practical men, and quite a number of these have already gone to the Exposition. Our most successful mechanics—masters—are those who have raised themselves from the position of employes to employers. It is doubtful if this fact exists to so great an

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extent in England. Many also of those of this country not now connected with mechanical business, whose means enable them to visit Paris, are intelligent and observant men, perhaps formerly workmen, who will not fail to note whatever may be interesting and useful to our mechanics, and give the public the advantage of their observations.

Tobacco Morality.

The characteristics of an individual are vividly portrayed in little things. An exchange in relating the traits of inner life in the workshop, alludes to the moral caliber of the men by the way they get tobacco of their shop mates, by begging, or borrowing as they are most apt to term it. One man will offer his fellow workman his tobacco box from which to help himself: another will take a bit from his box and hand it be grudgingly to his companion, and another will deny that he has any tobacco about him or perhaps that he ever uses it. One man, a Jesuit in nature if not in creed, used to keep two tobacco boxes, one he called "The World," the other "Providence." When asked for a pipe of tobacco, he would answer, "I have not a bit in 'The World;'" then calmly go off to one of the secret smoking places and light his pipe with a serene conscience. If taxed with falsehood, or asked how he had got his tobacco, "I put my trust in 'Providence,'" he would answer, and the prevarication was as good to him as truth.

OFFICIAL REPORT OF
PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING JUNE 25, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
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On filing a Disclaimer	$10
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On filing application for Design (seven years)	$15
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In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

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65,987.—APPARATUS FOR FORMING BUMPER CARRIERS FOR RAILROAD CARS.—W. C. Allison, Philadelphia, Pa. Antedated June 10, 1867.

1st, I claim the combination of the block, H, handled eccentric, l, blocks B and C, and the devices herein described, or the equivalents to the same, for effecting the simultaneous action of the blocks, in the manner described.

2d, The combination, substantially as described, of the bending blocks, E and E' and F and F', with the blocks, B and C.

3d, The combination of the forming blocks, E and E', with the handled eccentrics, t t'.

4th, The arrangement on each of the several forming blocks of its spindle and collar in respect to the corner of the block, as described.

65,988.—MODE OF KEEPING EGGS.—B. D. Atwell and Miss G. H. Crawford Portage City, Wis.

We claim the application of the above recipe for preserving eggs, as herein described, using for that purpose the aforesaid ingredients, or any other substantially the same, and which will produce the intended effect.

65,989.—BOLT CUTTER.—A. S. Bailey, Knoxville, Ill.

I claim the combination of the head, A, provided with the stationary cutter, a, sliding cutter, c, provided with the head, d, spring, m, and the pivoted handles, B C, having the cams, n, formed thereon, when all are arranged for joint operation as herein shown and described.

65,990.—MACHINE FOR DRESSING MARBLE.—R. P. Bailey, Niagara Falls, N. Y.

I claim the employment of a series of spring blades or scrapers, h, in combination with the clamping arms, C, and head or stock, A, for acting successively on the material to abrade it to the form of said blades, when constructed, arranged and operating substantially as and for the purpose set forth.

I also claim the arm or holder, C, when connected with the head, A, or its equivalent, by means of pivot, d, and the bearing bolts, e e, arranged to allow the blades to adjust themselves to the work when rotated in either direction, substantially as set forth.

I also claim, in combination with the blade, h, and its set bolt, k, the chamfering away of the clamp sides at i i, substantially in the manner and for the purpose set forth.

65,991.—DRILLING INSTRUMENT.—N. Barnum and G. C. Schreiber (assignors to N. Barnum), St. Louis, Mo.

1st, We claim the stock, B, with a tool cavity and tapering slots for the screw, c2, in its lower end combined with the spring, C, and set screw, c2, substantially as described and set forth.

2d, The slotted tool, c, in combination with the spring holder, C, and its set screw, c2, and the tool stock, B, when acting substantially as set forth.

65,992.—ROTARY PUMP.—J. A. Bazin, Canton, Mass.

I claim the packing, f k, constructed as described, and arranged between the wings of the pistons, substantially as set forth.

65,993.—BLIND FASTENER.—A. Bingham, Newtonville, Mass.

I claim the blind fastener as composed of the catch lever, C, the stop, D, its shoulders, h h, and the catch, E, arranged and constructed so as to be applied to a blind and a window frame or sill, substantially as specified.

65,994.—WATER METER.—E. Blakeslee, Plymouth, Conn., and J. S. Hunter, Hartford, Conn.

1st, We claim the valve, I, having the opening, a, and passages, d and e, arranged in relation to the ports in the valve seat so as to operate substantially in the manner described.

2d, In combination with the above we claim the weighted lever, k, constructed so as by its movement to reverse the flow of water, substantially as herein set forth.

3d, In combination with the above we claim the diaphragm or piston, arranged substantially in the manner described.

65,995.—HARNESS SADDLE.—Valentine Borst, N. Y. City.

1st, I claim the removable hooks, C C, a dapted and arranged to and with the hollow bridge or pier, B, substantially as set forth, so that the saddle can be used with or without the hooks.

2d, I also claim the use of the terrets, D D, for securing the hooks, C C, in the ends of the hollow bridge of the saddle, substantially as set forth.

65,996.—MORTISING MACHINE.—S. C. Brown, Richmond, Ind., assignor to J. A. Fay & Co., Cincinnati, Ohio.

I claim the cutter, t, shaft, p, and pulley, m, attached to the flanged plate, n, when said plate is made adjustable upon the bed plate, r, substantially in the manner and for the purpose set forth.

65,997.—HAND LOOM.—J. D. Browne, Cincinnati, Ohio.

I claim the cranks, a b, and the rod or bar, D, having a center pin, c, and the guide plate, G, in combination with the shaft, C, substantially as herein described.

65,998.—MACHINE FOR FORMING SPECTACLE FRAMES.—Chauncey Buckley (assignor to Charles Parker), Meriden, Conn.

I claim the eye former or stretcher consisting of a plunger to enter the eye and a bed for the eye to rest upon, having an opening through it of the form of the eye desired for the plunger to pass into in combination with the holding pieces, d' d'' as set forth.

I also claim the combination of the adjustable supporting plates, c, the bed and the plunger, substantially as described.

65,999.—MODE OF TREATING HYDRO-CARBON OILS.—A. M. Burke and S. Wright, Cleveland, Ohio.

1st, We claim the herein-described process of consecutively treating oils, first, by alkali in the still, as specified, and subsequently by the use of acids in the agitator as a continuation of the said process, substantially as set forth.

2d, As a means for carrying out the herein-described process we claim the valve or plug, D, provided with suitable devices for operating the same in combination with the pipe, C, and still, substantially as described.

66,000.—STEAM WATER ELEVATOR.—Martin Burton, Indianapolis, Ind.

1st, I claim the arrangement of the chambers, A and B, and pipes, G H and C, in the manner and for the purpose substantially as set forth.

2d, The arrangement of the steam induction pipe, F, water induction pipe, D, eduction pipe, L, and valves, E M and N, float, I, rod, J, and lever, K, substantially as and for the purpose set forth.

66,001.—ELECTRO MAGNET.—S. G. Cabell, Quincy, Ill.

I claim a compound magnet consisting of two or more helices inclosed in soft iron tubes with the tubes so arranged as to separate the helices and both tubes and helices arranged concentrically around a central tube or bar, as herein described.

66,002.—CORN PLANTER.—H. W. Camp and A. W. Fox, Oswego, N. Y.

1st, We claim the index, B, when constructed, arranged, and applied to machines planting in rows, for the purpose and as herein specified.

2d, The wheel, E, provided with a zigzag rim surrounding its periphery in combination with the feeding bar, F, when constructed and operating substantially as herein described.

3d, The shields, h, and gages, m, in combination with the feeding bar, F, the whole constructed and operating substantially as herein specified.

4th, The shoes, K, for removing obstructions and regulating the depth the seed is to be planted in combination with the hollow teeth, p, and roller, P, when constructed in the manner herein set forth.

5th, The ratchet teeth with pawl, d, and cone, c, in combination with the driving wheel, A, index, B, and wheel, E, when these several parts are arranged and operating substantially as herein specified.

66,003.—CALENDAR CLOCKS.—C. M. Clinton and L. Mood, Ithaca, N. Y.

1st, We claim the twenty-four-hour escape made by the segmentary wheel, A, segment, B, and arm, C, when substantially made as described.

2d, We claim, in combination with the arm, C, the use of the eye, D, or its equivalent, acting in a variable and changeable space, between the nut sor burs, E and F, or their equivalents, both for the purpose of holding and adapting our various devices to each other and to allow a constant movement of our time escape-arm, C, while the rod, G, moves different or diverse distances according to the variable length of the months of the year, and also for adjusting the calendar and clock works to each other, as set forth.

3d, We claim the springs, I and H, acting on the correcting rod, G, and the segment, B, either one or both for preventing contingent or unintentional changes or displacements, and yet allowing the changes to be made by the mechanism of the clock and calendar at their appropriate times, as described.

4th, We claim the combination of the spring I, with the rod, G, as described, for the purposes of retracting the said rod or rods and its connecting parts and operating the calendar correctly through our other devices be the position of the clock and calendar what it may; and also for the purpose of obtaining a complete or supplementary driving power for our calendar, as described.

5th, We claim gearing the month cylinder into the month wheel either directly or by intermediate cog wheels, as described.

6th, We claim the vibratory shaft and cog wheel, or any similar device, and the gearing the same in any manner with the thirty-one-day wheel or days of the month device, when so made as to revolve the days of the week cylinder one or more days space, as described.

7th, We claim putting or making the cam for throwing out of gear the vibratory shaft and its cog wheel on the weight lever or cross bar of the thirty-one-days wheel, and we claim the detent, Y b, for holding the said cog wheel and its connected parts fast while out of gear; and we claim the gearing of the day of the week cylinder into the vibratory device; the whole of these just named parts as a combined whole or each acting separately by itself, as described.

8th, We claim the fixed stop, N, for checking the upward motion of the weight lever or cross bar by the pawl or dog, M, or other convenient part connected with the said lever or bar, as described.

9th, We claim making our registers or cylinders of calendar clocks either wholly or in part of paper, or other similar light material, for the sake of their lesser weight and strain on the mechanism of the calendar, as described.

10th, We claim the specific device of a month wheel made by the variable depth of teeth, Ua Ub Uc and Ud, to accomplish every possible monthly change reasonably requisite in a calendar clock, as figured and described.

11th, We claim the device of putting the month wheel in direct communication with the thirty-one-days wheel shaft or any part or portion of the thirty-one days wheel or shaft, as described.

12th, We claim placing the month escape cam on the shaft of the thirty-one-days wheel so that one tooth or month of the month wheel escapes in every revolution of the thirty-one-days wheel

13th, We claim a wheel cam or escape so made and operated as to act as a stop or detent to the month wheel and yet allow at the proper time that wheel to revolve as described, and also the making of an additional length of teeth to the teeth of the month wheel so as to fit and embrace the said cam or escape, as described.

14th, We claim the hinged lever, substantially made as described, and operating so as to produce the described results on the month wheel and escape detent of the thirty-one-days wheel on either one or both of the said parts, as described.

15th, We claim the employment or use of a hinged lever on the shaft of the thirty-one-days wheel when accomplishing any one or all of the purposes described.

16th, We specifically claim the shoe-shaped and convex cams, one or both on the end, T, of the hinged lever, as described.

17th, We claim centering and connecting the devices of the hinged lever, R, the cam or escape, Va, of the month wheel, the month wheel, U, the vibratory arm and cog wheel, Y, and through the said month wheel and said cog wheel, the month and the day of the week cylinders, immediately with the axis, V, of the thirty-one-days wheel or that wheel itself, as described, thus simplifying and making more compact our calendar.

66,004.—GAS APPARATUS.—Charles Deavs, New York, N. Y.

1st, I claim the use of two or more retorts connected together in pairs so that the first shall volatilize the oil or oily substance, and the second shall complete the conversion thereof into a fixed gas suitable for illuminating purposes, the said retorts being constructed and arranged substantially as and for the purpose herein above set forth.

2d, The combination with the conductor pipe, K, of a cooling trough, L, the water from which supplies the wash-box, substantially as and for the purpose set forth.

3d, The combination with the discharge end of the conductor pipe, K, of a perforated or reticulated disk, h, substantially as and for the purpose set forth.

4th, The combination with the oil reservoir, U, and retorts, B, B', of a cut off, y, constructed and operated substantially as herein described.

66,005.—WINDOW SCREEN.—R. G. Dennell, Saco, and Liberty B. Dennell, Portland, Maine.

We claim the combination of the cylinder, g, pin u, and pins, h, h, or their equivalent, l, cavity, v, spring, f, rotary cylinder, k, cog, m, groove, n, pin, w, and mortise, y, when constructed and operating in the manner and for the purposes specified.

66,006.—BOAT DETACHING APPARTUS.—Wm. A. Devon, Port Richmond, N. Y. Antedated June 11th, 1867.

I claim, first, the construction and application of the jointed hooks attached to the boat by an extended shank, in comb nation with the slides, g, and interposing springs, arranged and operating substantially as specified.

2d, The arrangement at opposite ends of the boat of detachable spring-hooks, constructed substantially as described, in combination with rod, rope or chain connections within the boat whereby they may be operated in unison to unlock the slides that secure the hooks in their closed condition, essentially as herein set forth.

66,007.—ANIMAL TRAP.—J. P. Emswiler, Knightstown, Ind.

I claim in a rat trap the combination of devices for disengaging the shaft, C, and actuating the fingers, K, and doors, D and F, substantially as described.

2d, The combination of the revolving fingers, K, shaft, C, eccentric, C1, rod E, and door, F, substantially as described.

3d, The combination of the revolving fingers, K, shaft, C, eccentric, C2, rods, D1, and doors, D, substantially as and for the purpose set forth.

4th, In combination with the revolving shaft, C, and fingers, K, and automatically acting door, F, opening into the upper chamber, I claim, the door, L, opening into the lower chamber, substantially as and for the purpose set forth.

66,008.—FARM GATES.—J. W. Epperson, Woodhull, Ill.

I claim, first, the spur wheel, E, operating substantially as described,

2d, The grooved rail, D1, of the gate, D, in combination with the spur wheel, E, and the revolving wheels, C, attached to the fence posts and upon which the gate slides on opening and closing.

3d, In combination with the gate, D, with horizontal rail, D1, and vertical strips, D2, I claim the spur wheel, E, shaft, E1, and winch, F, arranged to operate substantially in the manner and for the purpose set forth.

66,009.—DIES FOR SWAGING AND PUNCHING THE JAWS OF WRENCHES.—J. S. Farnsworth (assignor to E. G. Lamson), Windsor, Vt.

I claim the combination of dies and punch, constructed and operating substantially as described.

66,010.—CURTAIN FIXTURE.—M. R. Fenton, Washington, D.C.

I claim, first, the hinges, A, A, in combination with bar, C, and roller, D, substantially as and for the purposes specified.

2d, Hinges, A, A, pulley, J, cords, s and n, and roller, D, combined and operating in the manner and for the purposes substantially as herein described.

66,011.—APPARATUS FOR BORING CYLINDERS.—L. B. Flanders Philadelphia, Pa.

I claim, first, the combination of the boring bar, B, the casing, I, its train of wheels herein described, or the equivalent to the same, the nut, w, and the stationary feeding screw, G, the whole being arranged and operating substantially as described.

2d, The cog-wheel, q, its circular recess and grooves, t, t, in combination with the hollow spindle, r, and the rod, s, with its pin, s1, and spiral spring, n, the whole being arranged and operating substantially in the manner and for the purpose set forth.

3d, The bearing, E, in combination with the adjustable and conical split ring, g, and ring, g1, or its equivalent, the whole being constructed and arranged substantially as described.

4th, The split ring, b, in combination with the bearing, E, as and for the purpose described.

66,012.—SIDE-HILL PLOWS.—P. H. Flansburgh, Eden Township, Cal.

I claim, first, the two plates, C, C1, placed side by side and operating independent of each other, either by a hinge or rack and pinion, substantially as herein described.

2d, The levers, H and H', with the toothed segments, G and G', operating the plows by means of the independent vertical racks, E and E', substantially as and for the purpose described.

66,013.—BLEACHING.—J. B. Fuller, Norwich, Ct., assignor to self, J. P. Upham, Claremount, N. H., and E. T. Rice, New York.

I claim, first, the method herein specified of subjecting the fabric or fibers to the operation of elastic squeezing rollers, to produce a circulation of the bleaching liquid throughout the fibres of the fabric, substantially as set forth.

2d, The method of utilizing the chlorine gas contained in the fabric or fiber after it has been squeezed by elastic rollers by immersing the same in water, as set forth.

66,014.—CHUCKS FOR IRON PLANING.—M. C. Gardner, Rochester, N. Y.

I claim the sliding jaws, B, B, and the bracket or support, D, back of one of the jaws, B, B, to chuck lengthwise the table and at the same time using the jaws, B, B, for chucking both crosswise and lengthwise the whole table, in combination substantially as specified and for the purposes set forth.

66,015.—CHURNS.—J. C. Gaston, Cincinnati, Ohio.

I claim the guard chamber, C, having one or more openings, c, in its side wall, b, substantially as shown and described.

66,016.—PLOWS.—Lewis Gibbs, (assignor to Bucher, Gibbs & Co., Canton, Ohio.

I claim uniting the bar, A, to the share, B, at the point, a, underneath the share, as and for the purpose herein described.

I also claim a clevis made in two parts, with dovetailed recesses cast therein, so as to fit a dovetail or shoulder formed on the end of the beam, and united thereto by a bolt or key, substantially as herein described and represented.

66,017.—SPINDLES FOR SPINNING.—A. H. Gilman, Hopedale, Mass.

I claim the application of the step cap, C, to the spindle, A, by means or devices, such as when the cap may be encompassing or covering the step, and the spindle may be in revolution, shall not only cause the cap to be revolved with the spindle, but allow it, the said cap, to be freely raised off the step in order to enable such step to be supplied with oil as occasion may require.

I also claim the combination and arrangement of the collar, D, with the spindle, A, and the cap arranged with a step as set forth, the collar being for the purpose or object as explained.

I also claim the arrangement of the collar, D, and the stud, d, with the spindle, A, and the cap, C, provided with a recess or hole, c, to receive the stud and applied to a step, B, substantially as described.

66,018.—BOILER-FEED-WATER REGULATOR.—C. H. Gould, Cincinnati, Ohio.

1st, I claim the reciprocating rotary shaft, C, traversing the boiler side within a suitable horizontal sleeve, A, and provided with a float, F, inside of the boiler, and adjustably weighted lever, I, outside of the boiler, in combination with the adjustable rod, K, and valve guarded water supply pipe, substantially as set forth.

2d, I claim the arrangement of rod, K, bossed cap, P, diaphraghm, N, and water supply pipe, Q, for the purpose described.

3d, The oblong float, F, stem, E, reciprocating rotary shaft, C, sleeve, A, with steam tight joint or joints in combination with the rod, K, and diaphragm stop, N.

66,019.—SORGHUM EVAPORATOR.—W. Hanson, Willoughby, O.

1st, I claim the employment of the partitioned tank, M, provided with stop-cocks and hose, P and P', in combination with the evaporating vat, K, auxiliary fire box, I, dampers, X, X, constructed with turned up edges, Y, Y, Y', arranged and operating as and for the purpose specified.

2d, The framed bars, C, constructed as described, and connected together in sections by free joints, R, and provided with levers, T and T', in combination with the evaporating vat, K, provided with ledges, L, operating as and for the purpose set forth.

3d, Constructing the body of the evaporator with a main fire-box, E, at its front end, a wide and gradually contracted fire chamber, H, and auxiliary fire-box, I, arranged and operating as specified.

4th, Providing the main fire-box, E, with elongated draft openings, F, F, F, through the bottoms thereof, and with brick lined intermediate spaces between said openings, so as to operate as and for the purpose herein stated.

5th, The use of extended lever arms, U, U', located as shown, in fig. 1, and operating the drain gates, V, V', in the manner specified in combination with the evaporating vat, K, as set forth.

66,020.—MACHINE FOR BEATING AND PICKING COTTON.—David Harding, Lowell, Mass.

I claim the cylinders, O, N, R, armed with teeth as described, in combination with the main cylinder, C, the several parts being constructed and arranged as and for the purpose set forth.

66,021.—TORCH FOR LIGHTING GAS.—Wm. Edwin Heath, Pembroke Terrace, Great Britain, assignor to J. W. Bartlett, New York city.

1st, I claim the construction of the double case or cover having the perforated tubes, A and B, arranged one within the other, for the purpose and substantially in the manner set forth.

2d, The double handle, G, adapted either for burners constructed as shown in figure 3, or for ordinary gas burners, for the purpose and substantially in the manner set forth.

3d, The apparatus consisting of the tubes, A and B, cap, D, lamp, C, and socket, F, constructed and combined for the purpose and substantially in the manner set forth.

66,022.—ABDOMINAL SUPPORTERS.—William Henderson and J. Greenawalt, Pittsburgh, Pa.

We claim securing the end of the wire, L, by means of a spring catch, b, attached to the front plate, A, and operated by the knob, K, in the manner herein shown and set forth.

66,023.—DEVICE FOR CLOSING BOTTLES.—Conrad Herman, Baltimore, Md.

I claim the hinged clasp, A, fastened by means of the lugs, a, and screw, b, and having upright arms, d d', with the cover, B, pivoted to d', and fastened to d, by means of the lugs, o n, and screw, t, when arranged to operate substantially as described and set forth.

66,024.—LIME KILN.—Chas. Hinkley, Williamsville, N. Y.

I claim the combination and arrangement of the elliptic cupola, A, the inwardly widened furnaces, B B, sharp-edged pillars, h h, and flues, e e, as and for the purpose herein specified.

66,025.—PETROLEUM GAS BURNERS FOR HEATING PURPOSES.—D. S. Holden, New Orleans, La.

I claim a gas retort and burner, consisting of the concentric or annular oil chamber, C, in combination with a central air chamber or flue, B, provided with perforations, D', at or near the top of chamber, C, substantially as and for the purpose described.

66,026.—MACHINE FOR CLEANING MOSS.—Henry Hull, Pattersonville, La.

I claim the vibrating convex card, A, in combination with a fixed concave card, C, when the teeth of both project in the same direction and at the same angle as described for the purpose set forth.

66,027.—FIELD FENCE.—Marshal Ingersoll, Elyria, Ohio.

I claim the fence constructed and arranged in the manner and for the purpose substantially as specified.

66,028.—HYDRAULIC PRESSURE REGULATOR.—Isaac Judson, New Haven, Conn.

1st, I claim the combination of the two diaphragms, with the valve and its stem, when they are constructed, arranged, and fitted for use substantially as herein described and set forth.

2d, The combination of a ring or annular disk with either of the diaphragms when used to lessen the extent of the yielding surface of the diaphragm, substantially as herein described and set forth.

66 029.—POTATO DIGGER.—G. W. Kintz, West Henrietta, N. Y.

1st, I claim the double-winged mold-board plow, provided with the adjusting slats, b, and flaps, a, arranged and operating in the manner and for the purpose set forth.

2d, The combination and arrangement of the adjustable combs, D, with the double-winged slatted mold board, C, operating in the manner and for the purpose specified.

3d, The employment, in combination with the double-winged slatted mold board, of the rollers, e e, situated in the ends of the handles, as set forth.

4th, The combination with the double-winged slatted mold board of the shaker, composed of the plates, I, vibrating arms, o, and axle, G, with cogs, n, and the adjusting braces, L, as set forth.

5th, The employment of the pivoted vine puller, P, with ratchet rod, Q, so arranged as to operate from the rear for discharging the vines as herein set forth.

6th, The arrangement of the machine as a whole, consisting of the slatted mold board, C, combs, D, shaker, I I G L n o o, and vine puller, P Q, as herein set forth.

66,030.—ADJUSTABLE TIRES FOR WHEELS.—D. J. Kirkman and E. H. Gray, Winchester, Ill.

We claim, 1st, The cap, C, when constructed substantially as and for the purpose set forth.

2d, The shoe, D, when constructed substantially as and for the purpose specified.

3d, The cap, C, and shoe, D, as constructed in combination with bolt heads, e e, and screw bolt, d, substantially as and for the purpose described.

66,031.—PLOW.—D. J. Kirkman and E. H. Gray, Winchester, Ill.

1st, We claim the employment of a subsoil plow, F, when attached to the adjustable bar, m, said bar being constructed and arranged in the manner herein specified.

2d, The adjustable bar, m, double jointed arm, h, and hook, i, the whole combined in the manner and for the purpose set forth.

66,032.—NAIL EXTRACTOR.—A. Marden and A. H. Burgess, Philadelphia, Pa.

We claim the jaws, D D, when constructed with slightly tapering sides, hinged together at the top and having an intervening spring, which jaws rest in a corresponding tapering mortise, B, in the handle, A, and operate together in the manner substantially as described and for the purpose specified.

66 033.—MEAT CUTTER.—Wm. M. Miller, Tulpehoccan, Pa.

I claim the block, S, and spring arms, K, in combination with the screw nut, Y, and in the manner and for the purpose specified.

66,034.—BEAN PULLER.—S. W. Moore, Albion, N. Y.

1st, I claim the combination of the fixed and sliding bars, b f, armed with intermatching teeth, g' g', operating substantially as and for the purpose herein set forth.

2d, Hinging or jointing the teeth, g', in the manner and for the purpose specified.

3d, The employment of the guides or shields, i, in combination with the sliding bars, f, for the purpose set forth.

4th, The arrangement of the treadle P, rod, Q, pawls, m, and ratchet wheels, n n, in combination with the disks or cranks, M, connecting rod, L, and arms, H, operating to adjust and retain the roller, as herein set forth.

66,035.—BOOT CRIMPER.—Dewitt C. Mowrey, Milford, Mass.

I claim the combination and arrangement of the auxiliary jaws, with the clasp, the frustum, and straining screw.

I also claim the application of the auxiliary jaws to the clasp by means substantially as described, viz: by the arms provided with ears and by slots, having the supports arranged as set forth.

66,936.—MUCILAGE BOTTLE.—A. M. Olds, New York City, assignor to J. W. Hawxhurst. Antedated June 12, 1867.

I claim constructing and arranging, in connection with a bottle, an upright adjustable brush operating through its cap, substantially as and for the purposes herein set forth.

66,037.—EVAPORATING PAN.—S. Page, McAllisterville, Pa.

1st, I claim the adjustable plate, D', arranged as herein described, and employed to vary the size of the flue beneath the receiving or skimming pan, in the manner and for the purpose specified.

2d, I claim the combination with the finishing pan, G, and chamber, H, of the dampers, I J, arranged and operating in the manner and for the purpose set forth.

66 038.—GYMNASTIC SWING.—Alonzo P. Payson, San Francisco, Cal.

I claim a swing constructed with the supporting arms, C C, and the motive levers, E F, substantially as and for the purpose described.

66,039.—GANG PLOW.—J. C. Pfeil, Arenzville, Ill.

1st, I claim the lever, a, having the cam, e, attached and arranged to operate in combination with the tongue, C, and beams, B and B', as shown and described.

2d, Constructing the crank axles, E, with a tubular portion to fit on the end of the wooden axle, A, as shown and described.

66,040.—BURGLAR ALARM.—Charles E. Pierce, N. Y. City.

1st, I claim the lever, d, with projection, f, and indicating plate attached when arranged as and for the purpose set forth.

2d, The guards made up of the parts, n o and q q, or their equivalents, operating as described.

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3d, In combination with the guards as described, the slotted plate, m', and knob, p, for the purpose set forth.

4th, The forked lever, r, in combination with the window guards as described.

5th, In combination with the alarm movements the case or cover with openings as described.

6th, The catch lever or keeper, b, in combination with the center wheel, c, and the detent arm, as described.

7th, I claim so arranging the guard bolt that by means of cords or wires connected therewith, an indicator plate is raised at the same time the alarm is given.

66,041.—METHOD OF MAKING ILLUMINATING GAS.—Alonzo C. Rand, Union Mills, Pa.

I claim the combination of the tanks, A1 and A2, with the gas holder, J, operated substantially as and for the purposes herein described.

66,042.—CHURN.—James H. Roundey (assignor to himself and Amos H. Roundey), Oldtown, Me.

1st. I claim the double vibrating dashes, b b, when constructed and arranged to operate in manner substantially as and for the purposes specified.

2d, The arrangement of churn, A, the double vibrating dashes, b b, and the vibrating levers, B B, driven by crank, D, or its equivalent, all arranged to operate in manner substantially as described and shown.

66,043.—REIN HOLDER.—J. Scott Russ (assignor to W. N. Zimmer, and W. W. Coggshall), Rensselaerville, N. Y.

I claim the rein holder, A A, having a T-shaped tongue, constructed substantially as herein set forth.

66,044.—LIGHTING AND EXTINGUISHING GAS BY ELECTRICITY.—E. P. Russell, Manlius, N. Y.

1st, I claim the supplemental gas cock, S, attached to the main pipe, L, when opened and closed by clockwork, substantially as described, for the purpose of lighting the main burner, M.

2d, Also the jet, T, for burning off the match, substantially as and for the purposes set forth.

3d, Also the lever, U, in combination with gas cock, S, substantially as and for the purposes set forth.

4th, Also the wire, V, substantially as and for the purposes set forth.

5th, Also the spring arms, O, substantially as and for the purposes set forth.

6th, Also the revolving inclined friction plate, Q, constructed and operating substantially as and for the purposes set forth.

7th, The springs, P, in combination with the perforated arms, O, for the purpose of holding the matches in the position described.

8th, Also the screws, F F', in combination with the bolts, J J', and arms, H', substantially as and for the purposes set forth.

9th, The combination and arrangement substantially as described, of the main spring, K, gas cock, N, and arms, H' and O, for the purposes set forth.

10th, The hands, D D', arranged and operating as described, in combination with stop shaft, E, hollow shaft of worm, F, and thumb screw, I.

11th, Also operating the jet cock, S, by means of the fuse itself, substantially as and for the purposes set forth.

12th, Also placing the matches so as to revolve horizontally, substantially as and for the purposes set forth.

66,045.—CLOTHES DRYER.—E. D. Sanford, Baltimore, Md.

1st, I claim the revolving rack, composed of the tubular sliding box, I, collars, J J', rods, K, supporting ropes, O, and clothes lines. P, or their equivalents, when constructed and operated substantially as and for the purpose described.

2d, In combination with the sliding rack of a clothes dryer, I claim the weighted box, Q, constructed and employed substantially as described for the purpose specified.

3d, The arrangement of the rack, I J J' K O P, post, A, socket, B, bed frame, C, and braces, D, with the rope, N, loops, M, weight, Q, and pin or hook, L, combined and operating substantially as and for the purpose set forth.

66,046.—CUT-OFF VALVE.—I. M. Scott and W. R. Eckart, San Francisco, Cal.

1st, I claim the movable plates on partitions, n n', arranged between and in contact with the main valve, c, and cut-off valve, C, substantially as described.

2d, The screw, J, and spindle, h, together with the wheels, k m o, and the yoke, p, arranged for disengaging the plates, n n', from the action of the governor, substantially as described,

66,047.—HARVESTER PITMAN.—T. C. Sebring (assignor to Ira A. Hebbard), Rochester, N. Y.

I claim the automatic take-up, constructed substantially as described, being composed of a spring, s, and taper key, k, plug, C, and boxes, B and B', substantially as described.

66,048.—TOY PISTOL.—Benjamin Sherwood and Daniel Fitzgerald, New York City.

1st, We claim the lever, D, provided with a follower, C, on one end, and used in combination with the curved barrel and trigger, E, as and for the purposes specified.

2d, The combination of the rubber set in the socket, F, with the curved barrel and lever, D, as and for the purpose specified.

3d, The curved barrel, A, when used in combination with a follower which does not operate outside of the rear of the barrel, but which operates upon the ball or missile to be sent around the curve in the barrel, as and for the purpose specified.

4th, The form of the trigger, E, adapted to be laid in between the two halves of the pistol, and not to need fastening.

66,049.—WAGON.—S. W. Slocumb, Albany, Ill.

1st, I claim the circular bearing, C, in combination with the hub, D, when constructed substantially as described.

2d, The combination of the circular bearing, C, hub, D, plate, E, and ring, F, substantially as described.

3d, The circular bearing, C, when attached eccentrically to the axle, and in front of a line passing through the center of the wheel, substantially as described.

4th, The arrangement of the bolsters, H, when placed in rear of the axle, and the axle when placed in front of a line passing through the center of the wheels, substantially as described.

66,050.—GRAIN MEASURE.—Harlow C. Smith, Chicago, Ill.

Antedated June 22, 1867.

I claim a half bushel or similar grain measure, having its bottom composed of the stationary part, A, and the hinged portion, B, and provided with the spring hooks, D, or their equivalents for attaching the bag, all constructed and arranged to operate as shown and described.

66,051.—WRENCH.—Isaac H. Smith, Albany, N. Y.

I claim the adjusting screw, E, with flatted or concave side or sides, a a' a" a"', or their equivalents for the purpose set forth, substantially as described.

66,052.—UNIVERSAL JOINT.—R. T. Smith, Nashua, N. H.

I claim the combination of stirrups, B and C, with their bearings, d d, and e e, swinging on the intermediate shaft, g, on which shaft an intermediate cog wheel or cog wheels, or pulley or two pulleys, may be placed, essentially as represented in the accompanying drawings.

66,053.—BUTTONS.—J. R. Spooner, Lowell, Ohio.

I claim the button fastening above described composed of the bent plate, A A' having the teeth, a a a a, and the button, B, attached to it, substantially as and for the purpose described.

66,054.—LIGHTNING ROD INSULATOR.—Darius Stebbins (assignor to himself and E. Morse), Wallingford, Conn.

I claim an insulator constructed substantially in the manner described, so that the rod may be secured directly from the interior of the insulator, as and for the purpose specified.

66,055.—ADVERTISING MACHINE.—I. W. Sylvester, New York City. Antedated June 15, 1867.

I claim, 1st, The application to advertising of an endless curtain made to revolve automatically, at given intervals quickly so as to attract attention by its motion, and then slowly so as to be apparently motionless and to allow of the easy reading of the advertisements.

2nd, The device whereby the power moving the curtain is retarded at regular intervals by means of the arm, J, notching into, passing through and being relieved from the periphery of the clock wheel, substantially as herein described and set forth.

66,056.—SIGNAL FOR RAILROADS.—E. H. Tobey and Copley A. Nott, Watertown, N. Y.

I claim, 1st, The combination of the sliding signal box or other signal device with the mechanism for rotating the same in a horizontal plane in such manner that the said device when raised or elevated to a certain point in the signal frame shall be thrown in gear with said mechanism as and for the purpose herein described.

2nd, The combination of the signal device, capable of a sliding and rotary movement as described with the mechanism for imparting the rotary movement under the arrangement herein described so that the position of the said signal device when in gear with the said mechanism shall be determined by the position of the switch with which the mechanism is connected as and for the purpose set forth.

3d, The combination with the reflector box and its frame, and actuating mechanism of a day signal actuated by said mechanism in the manner and for the purposes set forth.

4th, The combination of the reflector box or other signal device and its sliding frame with the guide rods upon which the said frame is mounted and held, substantially as and for the purposes set forth.

66,057.—BED BOTTOM.—Asa M. Tomb, Lyons, New York.

I claim, 1st, The reversible buckle, V, furnished with hook head at the end of each bar and with the hook, a, for securing on either side of the rail as described.

2nd, I claim the hollow fastening to the bed rail or to a piece of wood attached to the bed rail as shown at fig. III in combination with the reversible buckle and pin.

66,058.—FIRE ESCAPE.—J. Wagner and J. Schmid, Philadelphia, Pa.

1st, We claim in elevators and fire escapes the lattice frames in combination with the jointed racks, D D' the operating pinions, E E' and the take up cylinders, F F', the same being arranged to operate together substantially as described for the purpose of elevating and giving stiffness and steadiness to the lattice frames when in use.

2nd, We also claim in combination with the lattice frames, A, of an elevator and fire escape the friction wheels, G, and the bearing posts, H, arranged to operate together substantially as described for the purpose of giving additional stability to the lattice frames when elongated as described.

66,059.—DOOR LOCK.—W. P. Wentworth, Detroit, Mich.

I claim the slot, B, in the bolt, A, in combination with the inclosed tumblers or palls, O, operating as set forth.

66,060.—SODA AND MINERAL WATER STAND.—C. M. Welden, Pittsfield, Mass.

I claim, 1st, A soda and mineral water stand with one or more transparent sides, substantially as and for the purpose described.

2nd, The double flanged corner-pieces, c, in combination with the transparent plates, B, forming the sides of the stand, A, substantially as and for the purpose set forth.

3d, The tubular packing pieces, d, in combination with the transparent plates, B, and corner pieces, c, of the stand, A, constructed and operating substantially as and for the purpose described.

66,061.—CAR COUPLING.—J. F. Wotring, Willey, West Va.

I claim, 1st, The combination of the hinged bar, B, hinged pin, C hinged guide, D, substantially as and for the purpose described.

2nd, In combination with the pivoted pin, C, which is allowed to swing freely about a pivot, c. I claim the recessed guide block, D, for guiding the pin, C, and link, G, substantially as described.

3d, The construction of the block, D, with side jaws, g g, and a groove, g' substantially as and for the purpose described.

4th, The manner substantially as herein described of ensuring the proper relation of the link to the pin and of coupling two cars together when such cars are moved toward each other, as set forth.

66,062.—FIRE-PROOF SAFES.—E. H. Ashcroft, Lynn, Mass.

I claim, 1st, In a fire-proof safe the combination of a water space or chamber, d, with the pipes, I, leading therefrom and surrounding the door constructed and operating in the manner shown and as set forth.

2nd, In a fire-proof safe a lining of felting, b, or the equivalent thereof, for the purpose specified.

3d, In a fire-proof safe the combination of a water chamber with a safety plug, or its equivalent, for the purposes set forth.

66,063.—GAGE FOR STEAM GENERATORS.—E. H. Ashcroft, Lynn, Mass.

I claim the combination of the valve rod, h, with the valves, i and j, and with the inlets, A and B, and glass tube, C, constructed, arranged and operating in the manner substantially as shown and described and for the purpose set forth.

66,064.—POTATO DIGGER.—L. A. Aspinwall, Albany, N. Y.

1 claim, 1st, The construction of the separators having three rows of fingers in their horizontal range.

2d, The direct connection of the separators with the cranks.

3d, The employment of the roller.

4th, The combination of the roller with the fork.

5th, The bent lever, T.

66,065.—FASTENING THE ENDS OF COTTON TIES.—Arthur Barbarin, New Orleans, La.

I claim the device, A, when constructed as herein described for the purpose set forth.

66,066.—GAS CARBURETOR.—J. A. Bassett, Salem, Mass.

I claim, 1st, A gas carbureting chamber surrounded by the casing of iron or other fire proof material, substantially in the manner shown and for the purpose set forth.

2d, A gas carbureting chamber having the inlet for hydro-carbon and waste exit arranged substantially as set forth.

66,067.—APPARATUS FOR CARBURETING AND REGULATING THE FLOW OF GAS.—J. A. Bassett, Salem, Mass.

1st, I claim a regulator in combination with a closed carburetor so as to regulate the flow of gas after being carbureted without risk of leakage, substantially as described.

2d, The construction of a gas regulator substantially as shown and described.

3d, Retaining the diaphragm, H, in place and the gas joint made at the flanges, substantially as specified.

4th, A diaphragm prepared with the composition described or its equivalent when used for this purpose substantially as set forth.

5th, A diaphragm composed of two or more sheets of flexible material enclosing a sheet of malleable metal in the manner and for the purpose as shown and described.

66,068.—CARBURETING GASES.—J. A. Bassett, Salem, Mass.

I claim, 1st, The arrangement of a hydro-carbon reservoir above and connected with a carbureting chamber either with or without capillary, substantially as set forth.

2d, The overflow receptacle connected with the carbureting chamber for the purpose set forth.

3d, The process of carbureting gases for illumination by the method, substantially as specified.

66,069.—MODE OF CARBURETING GASES FOR HEATING AND ILLUMINATION.—J. A. Bassett, Salem, Mass.

I claim, 1st, The process of charging gases with the vapor of atomised hydro-carbon fluids for illuminating and heating purposes, substantially as set forth.

2d, The apparatus as shown and described with the several parts or their equivalents when used for this purpose for carbureting air or gases for illuminating and heating purposes in the manner substantially as set forth.

66,070.—MANUFACTURE OF ILLUMINATING GAS.—J. A. Bassett, Salem, Mass.

I claim, 1st, The process herein described for the manufacture of illuminating gas, which process consists in charging a mixture of coal gas or its equivalent and air with the vapor of any suitable hydro-carbon liquid, substantially as described.

2d, The improved illuminating gas made substantially as set forth.

66,071.—MANUFACTURE OF ILLUMINATING GAS.—John A. Bassett, Salem, Mass., assignor to John H. Irwin and Isaac Simmons.

1st, I claim the manufacture of an illuminating gas from the vapor of gasoline or other volatile hydro-carbon liquid, when the apparatus used is placed above the point of combustion, and so arranged that the gas is distributed to the burners by its own gravity.

2d, I claim a series of two or more pans or receptacles for oil, B B, so arranged one above another within the case, A, as to produce a large carbureting surface, and at the same time admit a current of air to pass automatically down over the surface of the oil in the pans, substantially as and in the manner set forth.

3d, I claim the combination of the pipe, F, and case, A, when so connected that the oil flowing over into the bottom of the carbureter will stop the passage of the gas into the pipe, F, and thereby extinguish the lights before the oil will flow down said pipes.

4th, I claim in combination with inlet for air, D, the pipe, G, when arranged and operating substantially as and for the purpose set forth.

66,072.—CONSTRUCTION OF FIRE-ARMS.—John E. Blake, Norwich, Conn.

I claim the fire-arm constructed as described, and provided with notches, e f and g, in the stock, arranged in relation with each other to form the bearings for the trunnions of the hammer and trigger, and for the heel of the spring, as shown and described.

66,073.—SHOE STRING FASTENER.—William G. A. Bonivill, Dover, Delaware.

I claim the combined fastening, A I, arranged to operate substantially as and for the purposes set forth.

66,074.—HAY SPREADERS.—George E. Burt, Harvard, Mass.

1st, I claim the forks, f, when so operated as to revolve around a common centre, and at the same time to have an oscillatory motion communicated to them by the positive action of mechanism by which their points shall be thrown forward with an accelerated motion when acting upon the hay, and be retracted when throwing off the hay, substantially in the manner set forth.

2d, So arranging the revolving shaft, L, that it shall pass eccentrically through the dead centre. U and receiving motion from the wheel, W, through the pinion, P, shall communicate it to the fork, f, substantially in the manner set forth.

3d, The combination of the shaft, L, placed eccentrically to the centre of the rotating heads, b, with the arms, d, shafts, a, and forks, f, substantially in the manner set forth.

4th, The balancing of the tedder by the rake, substantially as described.

66,075.—STEAM DRYING CYLINDERS.—H. W. Butterworth, Philadelphia, Pa.

1st, I claim the standard or bearing, B, with its chamber, b, and opening, f, in combination with the tubular spindle, A, projecting into the said chamber a packing ring, i and follower, D, or its equivalent, the whole being constructed and arranged substantially as and for the purpose described.

2d, The combination of the follower, D, and a screw stud turning in the follower and projecting through stand, substantially as and for the purpose set forth.

66,076.—DUMPING WAGONS.—Nich. Clute, Schenectady, N. Y.

I claim the plates on the bed frame, in combination with the rollers connected to the body or movable frame or their equivalents, substantially as described.

I also claim the stops at the rear end of the moveable frame, provided with catches to lock it to the bottom frame, substantially as described.

I also claim in combination with the plates and rollers above claimed the crank shaft, pinion and rack fastened to the movable frame.

66,077.—CANS AND PAILS FOR HOLDING PAINT.—Frederick W. Devoe, New York City.

I claim the hooked tongues, C, arranged at the upper edge of the pail or can and in relation with the cover, B, thereof, substantially as herein set forth for the purpose specified.

66,078.—MACHINE FOR SHRINKING TIRES.—Daniel Ellenwood, Jr., Garrettsville, Ohio.

I claim the frame, A, yoke, B, flange, F, in combination with the adjustable shoulder, D, for the purpose and in the manner specified.

2d, Levers, I, cams, K, as arranged and operated by the screw, H, and adjustable nut, J, in combination with the frame, A, shoulder, D, flange, F, and yoke, B, for the purpose and in the manner as set forth.

3d, Sections, c and b, in combination with the flange, F, and shoulder, D, for the purpose herein set forth.

66,079.—HOISTING DEVICE.—Sam C. Goodsell, New Haven, Ct.

1st, I claim a hoisting apparatus in which the cylindrical or conical winding drums, whether of the same or of unequal diameters, are combined with the hoisting rope and pulley and gears under the arrangement herein set forth, so that the weight shall be raised or lowered with a differential motion.

2d, The combination of the conical or cylindrical winding drums and their gears, of the hoisting rope attached to said drums under the arrangement herein described, so that when the drums are not caused to rotate by their operative mechanism the weight suspended from the said rope shall cause the locking of the gears as set forth.

3d, The combination in an apparatus such as described of the winding drums or cylinders and their gears, with the mechanism for rotating the same, arranged and operating as herein shown and specified.

4th, The combination in an apparatus as described of the winding cylinders and mechanism for revolving the same, with the truck wheel upon which the said apparatus is mounted, under such an arrangement that by the movement of the cylinders the said wheels may be rotated and the apparatus moved in either direction as set forth.

5th, The combination with the truck wheels, winding cylinders, and mechanism for revolving the same, of the clutches for throwing said wheels in and out of gear with said cylinders and driving mechanism, substantially as shown and specified.

66,080.—VACUUM PAN SUGAR-BOILING APPARATUS.—Charles Harriman, New York City.

I claim the combination with an apparatus substantially of the character specified, of a Torricellian pipe or tube, E, connecting the receiver, C, with a vessel or vessels below, essentially as and for the purpose herein set forth.

66,081.—CHUCKS.—G. W. Harris and Wm. H. Haight, (assignors to William H. Haight), New York City.

We claim the operating ring, e, constructed with the internal screw, g, and the nut, B, formed with radial grooves, e', in combination with the conical shell, A, and sliding jaws, C, substantially as and for the purpose herein described.

66,082.—CRACKER MACHINE.—John E. Hawkins, Lansingburgh, N. Y.

1st, I claim the conducting tubes divided into two parts, T and T', in combination with the knife, K, working between them substantially as described

2d, The knife, K, consisting of a thin plate of sheet metal provided with holes for the dough to pass through, in combination with a spring to throw the knife and the lever, i, and cam, i', to move back the knife so that the dough can again pass through the holes, substantially as described.

3d, The outside tubes or thimbles working on the lower sections, T', of the conducting tubes, and operated substantially as described.

4th, The docker, consisting of the plates, o p r and s, the prickers, v, stamper, W, and spiral springs, S and u, all combined, constructed and operating substantially as described, to press, prick and stamp a row of crackers at one operation, substantially as described.

5th, I claim the mechanism moved by a crank on the main driving shaft, by means of which an intermittent motion is given to the grooved rollers, the endless apron and the docker, substantially as described.

6th, I also claim in combination with the docker the thin plate, R, constructed, arranged and operating substantially as and for the purpose described.

66,083.—HOT-AIR FURNACE.—F. C. Hesse, Cincinnati, Ohio.

1st, I claim the annular supply chamber, I, provided with the dampers, f f', when secured to the bed plate, A, or its equivalent, having the perforations, e, substantially as and for the purpose specified.

2d, The casing, F, having perforations, a' the incline perforated plate, b, attached thereto, and the diaphragm, K', all in combination with the base plate, A, with perforations, a, the inner wall, B', of the dead air chamber and the top plate, C, substantially as described.

3d, The base plate, A, walls, B B', and top plate, C, in combination with the fire pot, G, perforated fire back, H, diaphragms, K K', warm air tubes, L, casing, F, hot air reservoir, N, smoke pipes, O and Q, smoke stack, P, and damper, P", constructed and arranged substantially as and for the purpose specified.

4th, The hot air reservoir, N, smoke pipe, O, smoke-stack, P, having an opening, P', near its bottom, and the damper, P", for closing the same, in combination with the smoke pipe, Q, substantially as described.

66,084.—CURTAIN FIXTURE.—Jacob J. Hessler, Reading, Pa.

I claim the sliding knob, B, working through the slot, b, of the barrel, A, and arranged in relation with the rod, c, and spiral spring, d, contained in the said barrel, substantially as and for the purpose specified.

66,085.—ROTARY STEAM ENGINE.—William H. Holland, Chelsea, Mass.

1st, I claim the chambered drum, E, and journals, F F, when constructed and operating substantially as described and for the purpose set forth.

2d, I claim the groove or depression, x x, on the drum on each side of the piston, as and for the purpose described.

3d, I claim the arrangement of the packing on the upper portion of the abutment, D, as described.

4th, I claim the arrangement of the packing piece, w, placed at the bottom of the abutment groove for the purpose of packing the space between the end of the abutment and the drum, E, and also between the drum and the cylinder over the packing rings as described.

5th, The arrangement of the spring, o, with the abutment, D, drum, E, and groove or depression, x, as and for the purpose set forth.

6th, The exhaust passage, p, one or more placed in the cylinder for the purpose of relieving the abutment of the pressure of the steam just previous to its being raised to allow the piston to pass.

7th, I claim the arrangement of the fly wheel or pulley, provided with cams between the cylinders as shown.

66,086.—HARNESS PAD.—John Hosford, Monroeville, Ohio.

I claim the arrangement of the upper tree, C, and flanges, a, in combination with the lower tree, A, when combined with the usual adjuncts to form a harness pad.

66,087.—BALE-BAND TIGHTENER.—Platt C. Ingersoll (asignor to himself and H. F. Dougherty), Greenpoint, N. Y.

I claim the clamping locks or grippers, B C, in combination with each other and with the lever, A, substantially as herein set forth for the purpose specified.

66,088.—SEEDING MACHINE.—P. C. Ingersoll (assignor to himself and H. F. Dougherty), Greenpoint, N. Y.

1st, I claim the combination of the series of adjustable slides, c, with the series of holes or openings, b, formed in the circumference of the rotating hopper, C, substantially as and for the purpose herein set forth.

2d, The adjustable sliding gate, C*, arranged in relation with the rotating hopper, C, substantially as and for the purpose specified.

3d, The lever, g, combined in relation with the sliding gate, C*, and rotating hopper, C, substantially as and for the purpose specified.

4th, The transverse spurs or projections, j, arranged in relation with the angular circumferential rib, i, of the furrowing wheel, F, substantially as and for the purpose specified.

5th, The drag-bar, D, arranged in rear of the seed dropping mechanism, and furnished with covering shares, constructed as described, substantially as and for the purpose specified.

6th, The lever, H, and lifting cords or chains, n r, arranged in relation with each other and with the furrowing wheel and drag bar, substantially as and for the purpose specified.

66,089.—PREPARING COTTON SEED FOR PLANTING.—P. C. Ingersoll (assignor to himself and H. F. Dougherty), Greenpoint, N. Y.

1st, I claim the process of preparing cotton seed for planting by subjecting the same to a rubbing action between a corrugated and a rubbing surface, substantially as herein set forth.

2d, The corrugated rubber, in combination with the bed having a roughened surface, substantially as and for the purpose specified.

66,090.—BURGLAR-ALARM LOCK.—George Jacobs, Washington, D. C.

1st, I claim the employment of arms, L N O, for the purpose of holding and letting off the alarm arrangement, substantially in the manner set forth.

2d, In combination with the above, I claim the sliding pivot, C, and spring, e, substantially as and for the purpose described.

3d, The circular plate, D, provided with deceptive holes, in combination with arms, L N O, operating substantially as specified.

4th, I claim the arrangement of bolt, A, arms, L N O, spring, M, sliding pivot, C, and plate, D, substantially for the purpose described.

66,091.—SPINDLE BEARING.—B. H. Jenks, Bridesburgh, Pa.

I claim the combination of the bolster cap and rail, arranged as shown and described, and constructed and operating as set forth.

66,092.—ROTARY STEAM ENGINE.—C. Kaiser, New York City.

1st, I claim the segmental piston, B, moving in the cylinder, A, in combination with the transversely sliding valve, C, constructed and operating substantially as and for the purpose deseribed.

2d, Connecting the piston, B, to the piston wheel, F, in such a manner that it is free to rock, substantially as and for the purpose set forth.

3d, The slide valve, C, and segmental piston, B, in combination with the jacket, J, on the cylinder, constructed and operating substantially as and for the purpose set forth.

4th, The cut-off, K, in combination with the slide valve, C, segmental revolving piston, B, and cylinder, A, constructed and operating substantially as and for the purpose described.

66,093.—MACHINE FOR PRESSING PEAT.—F. Leach, Tioga, N. Y.

1st, I claim the combination of the receiving box, A, with the mold box, B, stationary plunger, D, and pressing plunger, C, when said mold box is operated by any suitable means, as described, and the plunger, C, actuated by fluid under pressure, essentially as set forth.

2d, The combination of the rams, K E, cylinders, F L, pressing plunger, C, mold box, B, with its stationary plunger, D, and receiving box, substantially as shown and described.

3d, The combination, with the ram, K, of the cylinder and its pressing plunge , of valves controlling the supply of the operating fluid thereto from different sources or under different pressures, essentially as specified.

4th, The automatic operation of the mold box and pressing plungers under different heads or pressures by separate and distinct valves, geared together for operation by the mold box and pressing plunger, substantially as herein set forth.

5th, The valve, R, constructed for operation and adjustment, essentially as shown and described.

66,094.—CURTAIN FIXTURE.—Chapman Lee and Joseph Pandler, Washington, D. C.

1st, We claim the combination of a gear wheel and pinion with the cord wheel, for operating a window-curtain roller, substantially in the manner set forth.

2d, We claim the combination of the spring, D, locking bolt, C, and slide, E, for tightening the cord in connection with the notched plate, A, and cord wheel, B, substantially as described.

66,095.—FULLING STOCKS.—William B. Lodge, Danbury, Ct.

1st, I claim the combination, with the hammers or heaters, B, of the cam or friction blocks, C, operating to effect the lift of the former, and to suddenly release them when raised, substantially as specified.

2d, The combination, with the hammer or hammers of the mill, of an adjustable spring tension device, arranged to control their fall, essentially as herein set forth.

3d, The combination toes, G, made of india-rubber, or other analagous soft material, with the hammers, B, substantially as specified.

4th, The combination with the heater, B, of the hot-water box or bath, J, and the bosom, H I, operating on the material being fulled, substantially as specified.

66,096.—MACHINE FOR SIZING OR PLANKING HAT BODIES.—Wm. B. Lodge and H. Platner, Danbury, Ct.

1st, We claim the combination with the upper and middle aprons, E F, arranged to travel as described, of the shell, Q, at the exit end of the upper apron, essentially as and for the purpose specified.

2d, The combination, with the aprons, E and F', of a guideboard, R, and roller, S, at the feed end to said aprons, traveling as described, substantially as herein set forth.

3d, In combination of endless lag aprons, apertaining with their contiguous surfaces in opposite directions, as and for the purposes specified, the arrangement of a steam pipe or coil for the introduction of steam between said aprons, essentially as specified.

4th, The combination with the vertically adjustable aprons, F and F', of counterbalance weights, or their equivalent, to facilitate the adjustment of the same relatively to a center or fixed apron, substantially as described.

66,097.—MACHINE FOR SIZING HAT BODIES.—W. B. Lodge, Danbury, Ct., and H. Platner (assignors to themselves and F. Shaller), Hudson, N. Y. Antedated June 15, 1867.

1st, We claim, in hat-planking machines, the arrangement of three or more endless belts or aprons of lags, made to travel with their contiguous faces or surfaces in opposite directions, all at different velocities, relatively to each contiguous one, substantially as specified.

2d, The combination with an endless belt or apron, E, of lags having a fixed or positive motion of two or more endless lag belts or aprons, F and F', arranged as specified, and so geared to operate in connection with the belt, E, as that they, F and F', can, during the progress of the work, be made at pleasure to travel with their surfaces adjacent to E, in a reverse direction, at a reduced velocity, relatively thereto, or be left free to act independently of it, substantially as described.

3d, The combination of the lag belts, E and F or F'. drums, B and B1 or B2, at the one end of the machine, wheel, P, levers, U or U1, and wheels, Q and S or R and T, for operation, essentially as and for the purposes herein specified.

4th, Constructing the sideboards, D1, with their rails, c1, in sections, and holding or uniting them by springs or weights and screw bolts, to give the

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lag apron, F or F1, a vertically flexible character, substantially as herein set forth.

5th, The combination with a stationary arranged endless lag belt or apron, E, of one or more lag aprons, F or F1, arranged to travel at a reduced velocity, and relatively to the belt, E, as specified, and made vertically adjustable in relation thereto by means of lifting cams, G G1, or other suitable devices, essentially as specified.

6th, The combination with an endless lag belt or apron, E, having inflexible rails or guides, c, of an endless lag belt, F or F1, with its rails or guides, c1, made in sections and flexible, said aprons, E and F or F1, being arranged and operating relatively to each other, substantially as described.

66,098.—MACHINE FOR SETTING CARD TEETH.—David McFarlane, Worcester, Mass.

I claim, 1st, The combination with the clamp which feeds the wire, of the following mechanism, viz., the lever, D, whether adjustable or not, arranged to operate between the clamp and the operating cam so as to give to the clamp its lateral motion, and a separate and independent clamping lever or device for actuating the clamp to hold and feed the wire, substantially as set forth.

2d, The combination of the feed lever, D, spring clamping lever, E, and wire holding lever, F, with the clamp, a, substantially as set forth.

3d, The combination with lever, D, of the fulcrum pin or stud, b, collar, m, and adjusting screw, p, or equivalent means for making the collar adjustable, substantially as and for the purposes set forth.

4th, In a machine such as described I claim the construction and arrangement of the lever for producing the feed substantially as described.

5th, The combination of the doubler plate, K, and crowner bar, R, with the doubler, P, and doubler bar, O, made adjustable as and for the purposes set forth.

6th, The combination with the wing plate, T, crowner bar, R, and cam block, 17, of the compound or three-functioned cam, V, all constructed and operating in relation to one another and to the doubler plate, K, substantially as and for the purposes set forth.

7th, The combination with the clamp, a, of the bow or plate spring, g, and spiral spring, h, arranged for joint operation substantially as and for the purposes set forth.

8th, The combination with the perforating bar of the mechanism for operating the same, arranged as herein described, so that the said bar may be elevated before its forward motion is imparted, for the purposes stated.

9th, The combination with the upright dogs, 42 and 43, and double inclined and grooved cam, 44, of the holding box, 46, substantially as and for the purposes set forth.

10th, The combination of the ratchet wheel, 41, of the retaining dog, 45, feeding dogs, 42 and 43, double inclined and grooved cam, 44, and holding box, 46, arranged for joint operation substantially as and for the purposes set forth.

11th, The combination with the stop lever, D", of the stop guard, F', substantially as and for the purposes set forth.

66,099.—BOOT LACING DEVICE.—A. McKenney, Portland, Me., and S. Carpenter, Patten, Me.

We claim a shoe lacing device constructed to operate substantially as set forth.

66,100.—SPIKE.—John McMurtry, Lexington, Ky.

I claim the within described spike, consisting simply of a single shank provided with a beveled or sloping end and shoulder, said shoulder and beveled end being upon the same side, as and for the purpose set forth and described.

66,101.—MANUFACTURE OF SAFETY MATCHES.—Lotto P. Meyer, Bethlehem, Pa.

I claim, 1st, The application of certain ingredients substantially such as herein specified, for the preparation of a compound for safety matches and for the purpose specified therein.

2d, The application of certain ingrepients substantially such as herein specified, for the preparation of special surfaces for the ignition of safety matches and for the purpose specified within.

66,102.—MAKING PHOTOGRAPHIC TRANSFERS.—Arthur G. Mowan, South Bergen, N. J.

I claim, 1st, The combined process hereinbefore described for making photographic transfers by means of the several methods, preparations, applications, and compositions above described, or their equivalents.

2d, I also claim the preparation of the paper by a bath of whey or lactine as above described, when used in combination with the other elements of the process above described or their equivalents.

3d, The preparation and application of the coating of gelatine or its equivalent and permanganate of potassa, for the purposes above described, whether the same is used in combination with the other elements of my entire process or is used separately therefrom as a material to be acted on by the light and subsequently to be dissolved and removed where it has not been so acted upon.

4th, The use of a paper so prepared and coated as above described in the formation of the impression thereon by the action of the light according to the usual modes.

5th, The preparation and the application of the second coating above described, composed of Judea bitumen, white wax, and Burgundy pitch, or their equivalents, without grease or oil, for the purposes above described, whether the same is used in combination with the other elements of my entire grocess or is used separately therefrom, as a material to give color to the picture on the paper and to act as a medium for transferring it.

6th, The removal of both the coatings above described from the parts or spaces not acted on by the light, by placing the paper so prepared and coated with the materials above described, or their equivalents, in a bath of cold water in the manner above described, and cleaning it in the manner above described, orby any equivalent method of solution and removal.

7th, The impressing of a photographic picture or design or printed or written matter upon stone, wood, or metal, from a paper proof made and prepared as above described, for the purpose of engraving, lithographing, etching, or preparing plates for printing such picture, design, or printed or written matter.

66,103.—SPRING HINGE.—A. M. Olds, New York City. Antedated June 15, 1867.

I claim the hinge constructed substantially as described.

66,104.—RING TRAVELERS FOR SPINNING.—Henry T. Potter, Norwichtown, Conn.

I claim, 1st, The transverse bar, e, in combination with the ring and spindle, substantially as and for the purpose specified.

2d, The annular plate, b, arranged in relation with the transverse bar, e, the ring and the spindle, substantially as and for the purpose specified.

66,105.—BOAT-DETACHING TACKLE.—Carl H. Ramsten, Carlskrona, Sweden.

I claim a tackle block, D, provided with a locking lever, E, to a hinged or pivoted detaching hook, S, and fair-leaders, I, all arranged substantially as described and for operation in connection with or by a rope or chain, H, substantially as specified.

66,106.—STIRRUP.—Nathan L. Revere, Worcester, Mass.

I claim the combination with the stirrup, E, and strap, A, of the case B (having ears, c c, and a pin, b), spiral spring, e, piston rod, C, and head, D, said parts being constructed and arranged to operate in relation to each other substantially as and for the purposes set forth.

66,107.—BOLT CUTTER.—J. Strayer and T. Hazelhurst, South Bend, Ind.

We claim, 1st, The bolts, E, in combination with the cutters, C, and springs, G, arranged and operated substantially as above described.

2d, The combination of the springs, G, cutters, C, chuck, B, and bolts, E, substantially in the manner and for the purposes set forth.

66,108.—GATE.—Richard Tattershall and John A. Burchard, Beloit, Wis.

We claim, 1st, broadly, the oscillating circular plane, E, for the purpose set forth.

2d, A gate constructed subtantially as described, in combination with the double sliding hinge, C C B, the oscillating circular plane, E, lever, I, the crank levers, I, L, rods, K K, bell-crank levers, S S, the pulley, H, standard, A, and self-fastening latch, W, arranged and operating as and for the purpose specified.

66,109.—PLOW.—James Wallace, Sheridan, Pa.

I claim the jointed rod, D D', used in combination with the beam and the handle, H, as and for the purpose specified.

66,110.—MAGAZINE FIRE-ARM.—H. F. Wheeler, Boston, Mass.

I claim, 1st, A magazine pistol in which the cartridges are arranged in a vertical or approximately vertical chamber forming the handle, substantially as shown and described.

2d, I also claim effecting the movement of the cartridges to bring each into position to be fired by the vertical ratchet bar, x, carrying the cartridges transversely to itself, substantially as set forth.

3d, The flange groove or grooves and friction surface or surfaces for guiding and supporting the cartridges, substantially as described.

4th, The construction and arrangement of the expanding and contracting trigger lever, by which as the resistance to the forward movement of the barrel increases, the length of the acting arm of the lever decreases, substantially as shown and described.

66,111.—DRIVING BELT.—T. R. White and W. G. Bedford, Philadelphia, Pa. Antedated June 15, 1867.

We claim a driving belt composed of wires corrugated or bent as described and threads of cotton or other fibrous material interwoven as set forth.

66,112.—GUIDE FOR CARDING MACHINES.—F. W. and E. T. Albertine, Hanover, Conn.

We claim, 1st, The guide plate, A, perforated and slotted substantially in the manner herein shown and described and for the purposes set forth.

2d, The combination of the roller, E, with the guide plate, A, substantially as herein shown and described and for the purpose set forth.

66,113.—GATE.—David D. Baker, West Alexandria, Ohio.

We claim the combination and arrangement of the levers, c d, posts, e f, clasp hinges, x x, and slot bar, i, when constructed, arranged, and operating conjointly in the manner described for the purpose specified.

66,114.—THILL COUPLING.—Frederick Ballard, Waverly, Md.

I claim, 1st, The combination of the spring, G, box, F, and pressure bolt, E, constructed and operating in the manner and for the purpose specified.

2d, The soft metal bushing, K, provided with a square opening, k, and used in combination with the bolt, D, and tubular eye, I', of the thill iron, substantially as described.

66,115.—PICTURE HOLDER.—Albro Barber, Port Byron, Ill.

I claim a holder for photographic or other pictures in which a series of frames for the pictures is so arranged that by moving or drawing one end of the box out or in, such frames in regular order and succession will be brought in position for being viewed, substantially as described.

66,116.—CASTER.—James T. Barnes, Hudson City, N. J.

1st, I claim the axle, A, supporting two wheels, B, and having secured at its center and at right angles thereto the arm, C, supporting the shank, D, constructed as described for the purpose specified.

2d, I further claim the securing of the socket or sheath, E, in the leg or bottom of the article to which the caster is applied, by means of the spurs, d d, projecting laterally from the cylindrical part, a, and fitted in the hole, c, which receives said part, a, substantially as shown and described.

66,117.—ROOFING.—E. Becker, Cincinnati, Ohio.

I claim the curved edge and doubled over edge of the two overlapping edges of the metallic plates, A, substantially as and for the purposes described.

66,118.—BLACKSMITH STRIKERS.—George Bell (assignor to himself and Jonathan Strine), Martinsburg, West Va.

I claim the combination of the spring, R, adjusting device, W, frame, V, hammer and lugs, C J, chain, K, and treadle, L, all constructed and arranged as described.

66,119.—EXTRACTING GREASE AND OILS FROM ANIMAL AND VEGETABLE SUBSTANCES.—Joseph Besso, Philadelphia, Pa.

1st, I claim the improved apparatus consisting of the reservoir, A, the force pump, B, the retorts, C C', the alembic, D, the condensing vessels, E E', the receiving vessels, F F1 F2, the gasometer, G, and the steam pipe, h, combined, arranged, and operating substantially as and for the purpose herein described.

2d, The force pump, B, in combination with the reservoir, A, and the retorts, C C', arranged and operating as and for the purpose herein set forth.

3d, The gasometer, G, in combination with the pipe, g, and the retorts, C C', arranged as and for the purposes specified

66,120.—TINNER'S RULE.—Thomas Bigelow, Elkhart, Ind.

I claim the arrangement and construction of a rule comprising a system of scales, in the manner as herein set forth for the purpose specified.

66,121.—MACHINE FOR MAKING STARCH, PASTE, SIZE, ETC.—C. H. Blanchard, Boston, Mass.

I claim, 1st, The combination of the perforated diaphragms, O O, of the mixing tanks with the revolving brushes, K K K, substantially as described and for the purpose set forth.

2d, The device, or its mechanical equivalents, for giving the shafts, I I, of the stirrers their reciprocating motion, substantially as described and for the purpose set forth.

3d, The combination and arrangement of the hollow steam-heated cooking rolls, S S, substantially as described and for the purpose set forth.

4th, The combination and arrangement of the cooking tank, R, the rolls, S S, and the scrapers, T T, substantially as described and for the purpose set forth.

5th, The general construction, combination and arrangement of the several parts of the machine, substantially as described and for the purpose set forth.

66,122.—CHURN.—Frank Blecka, Elgin, Ill.

I claim agitators, C C", pinions, L L,' and wheel, T, when used in combination with a rotating case, substantially as and for the purpose set forth.

66,123.—COMBINED SEEDER AND FERTILIZER.—Henry Bourn, Mendon, Mich.

I claim, 1st, In combination with the driving bevel gear wheel, M, the the shaft, J, provided with the bevel pinion, L, and crank wheels, I and S, for the purpose of operating the agitating mechanism in both hoppers from the same shaft, substantially as set forth.

2d, The slide, F, provided with the brushes, K K, and moving the same across the escape orifice in the bottom of the hopper, and for the purpose set forth.

3d, The triangular slide, P, placed in the open bottom of the hopper and nearly filling the area of the same and provided with the spikes, Q, as and for the purposes set forth.

4th, Hanging one side of the hopper upon hinges or other joints so that the area of the hopper bottom may be increased or dsminished, in the manner and for the purposes set forth.

5th, The seat, T, adjustable forward and backward, as set forth, in combination with the main frame, A, and hoppers, D O, so that the weight of the driver may be caused to balance the machine, as set forth.

66,124.—MACHINE FOR UNHAIRING HIDES.—Elias Brock, Elenville, N. Y.

1st, I claim the combination of the pair of feed rollers, D E, with the knife cylinder, B, of an unhairing machine, substantially as herein shown and described and for the purpose set forth.

2d, Arranging the guide roller, F, knife cylinder, B, and feed rollers, D E, with each other and with the frame, A, of the machine, substantially in the manner herein shown and described, so that the hides or leather shall be drawn over the knife cylinder, B, in a direction opposite to that in which the surface of the said knife cylinder is moving.

3d, The combination of the roller, I, with the frame, G, to which the apron, H, is attached, substantially as herein shown and described and for the purpose set forth.

4th, Arranging the gearing, K L M N O P R, substantially in the manner herein shown and described, for the purpose of communicating motion from the knife cylinder, B, to the feed rollers, D E.

66,125.—MACHINE FOR SOFTENING OR DRESSING LEATHER OR SKINS.—F. J. Burcham, Racine, Wis.

1st, I claim the combination of the quadruple crank, C, pitman, D, levers, E, and connecting rods, G, with each other and with the stretching frame to which the skin is attached, substantially as herein shown and described and for the purpose set forth.

2d, The stretching frame, H, constructed and operated substantially as herein shown and described and for the purpose set forth.

3d, The stretching frame, N, constructed and operated substantially as herein shown and described and for the purpose set forth.

4th, The clamp, I, constructed and arranged substantially as herein shown and described and for the purpose set forth.

5th, The clamp, K, constructed and arranged substantially as herein shown and described, when used for the purpose of attaching skins to a stretching frame,

6th, The clamp, L, constructed substantially as herein shown and described, when used for the purpose of attaching skins to a stretching frame.

7th, The double spring-hook, M, constructed substantially as herein shown and described and for the purpose set forth.

66,126.—KNIFE CLEANER.—W. J. Burge, Atchison, Kansas.

I claim in a knife cleaner the combination of the handle, A, having a cavity, D, closed by a stopper, C, and the rubbing surface or layer, B, arranged, constructed and operating in the manner as shown and described and for the purpose set forth.

66,127.—FUNNEL.—Frederick Catlin, Watertown, Conn.

I claim the construction and arrangement of the funnel, A, having detachable throat, B, strainers, E F, valve, C, and stand, D, substantially as described for the purpose specified.

66,128.—COTTON CULTIVATOR.—G. W. Chambers and Isham Washam, Talladega, Ala.

We claim the arrangement of the lever, d, and the sliding cross piece, G, to engage and disengage the bevel gear, b b, in the manner and for the purpose herein specified.

66,129.—PORTABLE FENCE.—Peter Chandler, Olney, Ill.

1st, I claim the pin, b, in combination with the braces, B, and battens, C, substantially as and for the purpose described.

2d, In combination with the elements of the above, I claim the arrangement of the battens, D E, the former being provided with the notches, d d,' and retaining pin, d2, and the latter with slotted projections, e e', as and for the purpose set forth.

66,130.—MANUFACTURE OF BLANKS FOR CARRIAGE THILL SHACKLES.—J. B. Clark, Plantsville, Conn.

1st, I claim the carriage shaft shackle blank so formed between dies that the body, b, of the blank is curved, substantially as herein shown and described.

2d, The dies, A and B, for making the said blank when so constructed and arranged as to form the rounded corners and the curved body of the said blank, substantially as herein shown and described.

66,131.—FRAME FOR STRETCHING WET LEATHER.—I. W. Dawson, Newark, N. J.

I claim the combination and arrangement of the longitudinal bars, A and B, cross bars, C and D, inclined pivoted bar, E, and inclined stationary bar, b2, with each other, substantially as herein shown and described and for the purpose set forth.

66,132.—METHOD OF TRANSFERRING CARS FROM ONE TRACK TO ANOTHER.—John Denhard, Beading, Pa.

I claim the rails, A A', of the main track and the rails, B B,' of a turn out or siding in combination with the stationary inclined bar, e, and the movable bars, D D,' the whole being constructed substantially in the manner and for the purpose described.

66,133.—DRAIN PLOW.—R. W. Downman, Georgetown, D. C.

I claim the attachment of the double cone roller, B, as herein described to the ordinary drain plow, in the manner and for the purposes above stated.

66,134.—KALEIDOSCOPE.—John Earnshaw, E. Greenwich, R. I.

1st, I claim so constructing a kaleidoscope that both its ends may be used, as described.

2d, The object glass provided with lincs, G, substantially as described and for the purpose set forth.

3d, Covering the object glass, Fig. 1, with figured paper or fabric, as and for the purpose described.

4th, The object glass, Fig. 2, provied with hole, D, in its covering to adapt it for use as the eye glass, substantially as described.

5th, The windows, E, arranged substantially as and for the purpose set forth.

6th, The detached framework carrying the object glass, Fig. 1, as and for the purpose described.

7th, As an article of manufacture the design paper adapted for use in conjunction with a kaleidoscope, as herein described and for the purpose set forth.

8th, In combination with a kaleidoscope the pictures or designs and slotted receptacles therefor, substantially as described and for the purpose set forth.

65,135.—HARVESTER.—Jonathan Emery, Cedar Falls, Iowa.

I claim the flexible swinging curtain, H, arranged in the relation to the binders station and to the endless conveyer, G, and endless compressing apron F, substantially as and for the purpose set forth.

2d, The rotating platform, K, for supporting one or more binders in combination with a receptacle, E, into which the cut grain is delivered, substantially as described.

3d, The combination of the rotating binders station and the endless conveyor, G, and endless compressing apron, F, substantially in the manner and for the purpose described.

4th, The arrangement of the gears, chains and cranks for operating the aprons, F G, and the sickle, Q, directly from the main supporting axle and wheel, B B1 B2, substantially as shown and described.

5th, The arrangement of the pivots of the arms, P P, on each side of the driving wheel, B2 and below the axle in combination with the latch lever, p, rock shaft, r, arms, r' v, and link, u, arranged and operating as described and shown.

6th, A rotating binders station, in combination with a harvester.

66,136.—SAFETY RAILROAD SWITCH.—B. F. Farrar (assignor to himself and D. B. Wesson), Springfield, Mass.

I claim a railroad switch constructed and arranged that if left in a wrong position, the wheels of a passing train will return the rails temporarily to their proper position and the train continue upon the main track, substantially as herein set forth.

66,137.—MANUFACTURE OF WHITE LEAD.—T. M. and A. G. Felt, Brooklyn, N. Y., assignor to William Bell, New York City.

We claim the treatment of chloride of lead in the manner and for the purpose, substantially as herein described.

66,138.—MANUFACTURE OF WHITE LEAD.—Thomas M. and Ambrose G. Fell, Brooklyn, N. Y., assignor to William Bell, N. Y. City.

We claim the treatment of salts of lead other than carbonates, and the carbonate, of baryta, in the manner and for the purpose, substantially as described.

66,139.—MANUFACTURE OF WHITE LEAD.—T. M. Fell, and A. G. Fell, Brooklyn, N. Y., assignor to to themselves and William Bell, New York City. Antedated April 11, 1867.

We claim the treatment of chloride of lead in the manner and for the purpose substantially as herein described.

66,140.—MODE OF TREATING LEAD SALTS FOR THE MANUFACTURE OF WHITE LEAD.—T. M. Fell, and A. G. Fell, Brooklyn, N. Y. assignor to themselves and William Bell, New York City. Antedated April 11, 1867.

We claim the treatment of oxide of lead with the chloride of sodium or its equivalent, substantially as described for the purpose of producing a superior chloride or any oxy-chloride of lead.

66,141.—MACHINE FOR CUTTING CORKS.—L. W. Felt, Keene, N. H.

1st, I claim the cutter bars, F F, having the stops, F, F', in combination with the fixed collar, l, the reciprocating collar, s', the slots, t t, ring, s, and clamp, q, attached to the rod, P, and the beveled projections, x x, all constructed and operating substantially as herein described and for the purpose set forth.

2d, The reciprocating rod, g, in combination with the levers, e and d, for discharging the cork when cut from the cutters, substantially as herein described and set forth.

66,142.—AMALGAMATOR.—J. B. Forissier, New York City.

1st, I claim the arrangement of the circular revolving and annular stationary pans, the same being constructed as described, so that the water containing the ore may fall from top to bottom of the apparatus in a zig-zag line, and be thus distributed over the whole surface of the mercury, as set forth.

2d, The stirrers, L, when secured to the underside of the pans, G and H, and when they are constructed and operate substantially as and for the purpose herein shown and described.

3d, An amalgamator made and operating substantially as herein shown and described.

66,143.—BAND CUTTER FOR THRESHING MACHINE.—W. P. French, Washington, Iowa.

I claim the double adjustability caused by the means substantially herein set forth.

66,144.—SHOVEL PLOW.—Daniel Gilbert, Carbondale, Ill.

First, I claim forming the shovel or plow plate, F, with a groove or notch in the under side of its upper part to fit upon the bar, E, substantially as herein shown and described and for the purpose set forth.

Second, The combination and arrangement of the bar, E, with the upright C, and horizontal or ground bar, D, substantially as herein shown and described and for the purpose set forth.

66,145.—POTATO DIGGER.—J. E. Giles and Charles S. Mc Robert, Meads Mills, Mich.

1st, We claim the digger, H, and screen, J, constructed substantially as herein shown and described in combination with each other and with the frame, A, as and for the purpose set forth.

2d, The combination of the axle, C, lever, E, and chain, F, with each other and with the frame, A, substantially as herein shown and described for the purpose set forth.

3d, Operating the screen, J, from the drive wheel or wheels, D, by means of the bevel gear wheel, N, wheel, O, shaft, P, wheel, S, and arm, U, substantially as herein shown and described.

66,146.—WOOD TURNING LATHES.—Andrew Goodyear, Springport, Mich.

1st, I claim the combination in one machine for turning wagon hubs, of the sets of cutters one set of which may be brought into action for roughing out the hub and a second set then brought into action for the purpose of finishing the hub, the mechanism thereof, being constructed and arranged to operate substantially as set forth.

2d, The combination of the yoke from D, hinged to the main frame, A, roughening cylinder, C, arm, a, rod, r2, spring, s, said parts being respectively constructed and arranged substantially as described.

3d, So arranging the operating mechanism of the two sets of cutters that the roughening cutters shall revolve at a high speed at the same time that the hub subjected to its action revolve slowly, and the adjustable finishing cutter fixed upon sides shall act upon the hub when made to revolve at an increased speed, substantially in the manner set forth.

66,147.—BILLIARD CUE.—C. H. Gould, New York City.

I claim in combination with a billiard cue, I, the use or employment of a tip formed of hard and soft rubber, substantially as and for the purposes herein fully described.

66,148.—TABLE.—H. C. Hardy, Muncie, Ind.

I claim the weights, D D, and the levers, e e, in combination with the supporters, C C, arranged and operating substantially as and for the purposes herein described.

66,149.—APPARATUS FOR DRAWING AND WEIGHING LIQUIDS.—E. S. Harris and S. S. Robinson, Morrison, Ill,

We claim the faucet, A, and gate, B, when so arranged in combination with one another and with a trigger and other connecting mechanism that the gate shall be closed automatically when the trigger is tripped, substantially as and for the purpose set forth.

2d, The faucet, A, gate, B, bow, C, and spring, D, in combination with the trigger, E, lever, F, stop, G, and spring, H, arranged to operate substantially as set forth.

66,150.—BAG HINGE.—George Havell, Newark, N. J.

1st, I claim the metallic ornamental plate, B, having either an opening or stem in its end for connecting it to the bar, C, which bar is provided with a cylindrical head, d, or band, as described, so that when thus conected to the frame, A, A' they form a neat and substantial hinge, as specified.

2d, The bar, C, and plate, B, constructed substantially as herein described and used for the purposes specified.

66,151.—CANAL LOCK.—George Heath, Little Falls, N. Y.

I claim the mode substantially as herein described of filling canal locks.

66,152.—HEAD BLOCKS FOR SAW MILLS.—Joseph Hubbell, Zanesville, Ohio.

I claim the slotted plates, d, d, made fast on the setting bar, a, in combination with the friction rollers, i, i, on the end of the pushing bars, g, g, the pawl, m, with the rack, h, constructed, arranged and operating as and for the purposes herein described.

66,153.—APPARATUS FOR CARBURETING AIR.—J. H. Irwin, Chicago, Ill.

1st, I claim the combination of a carburreting device with a chandelier bracket or a portable lamp, when arranged and operating substantially as described.

2d, I claim in combination with a chandelier bracket or portable lamp, two carburreting vessel to contain two different grades of hydro-carbon oil substantially as and for the purposes specified.

66,154.—HARVESTERS.—Caleb Lee, (assignor to self and Joshua Lee, Sandy, Ohio.

I claim the combination and arrangement of the frame, A, drag bar, I having the bearings, J, J, for the crank shaft, H, and provided with double joints, K, jointed brace, L, shoe, M, and crank lever, N, all constructed and operated in the manner and for the purpose set forth.

66,155.—GANG PLOW.—John T. Legg, Lewis County, Mo.

I claim the plows, A, A', beams, e, e', rods, F, F', and g, g', the compound lever, H H', lever handles, K, K', and ratchets, M M', arranged, combined and operating for the purpose and in the manner substantially as described.

2d, I claim the lever, n, n', and ratchet, m, m', arranged, combined and operating for the purpose and in the manner described.

3d, I claim the stay chains, P, P', the beams, E, E', the tongue, Q, the strap, R, and the stiffening pole, S, arranged, combined and operating in the manner and for the purpose as heretofore described.

66,156.—VALVES OF STEAM ENGINES.—K. H. Loomis, Cincinnati, Ohio, assignor to Cornelius Van Brunt, Fishkill, N. Y.

I claim, first, the case or seat, B, constructed as described and arranged within a conical opening in its frame and provided with a tapering plug valve, C, said valve being provided with a transverse hub at its centre and with longitudinal slats on each side of said hub, the steam openings being uniform at their intersection, but made flaring from this point outwards and inwards, as specified, the whole being arranged as and for the purposes set forth.

2d, The arrangement of the conical spiral cams, L and I, upon the vertical governor shaft, in combination with the tapering plug valves, J', J', for regulating the flow of steam, to and from the cylinders in the manner herein specified.

3d, The valve seat, B, with central supports, b, b, bearing upon the cones, f, f, when arranged in combination with the valve, C, in the manner and for the purposes specified.

66,157.—STEAM ENGINE OIL CUPS.—F. Lunkenheimer, Cincinnati, Ohio.

1st, I claim the hand wheel nut and cap formed of the parts marked A, A', and A'', arranged and combined substantially as described.

2d, The screw bolt, B, attached to the bottom of the chamber, C, by which the cup and parts attached to the cup are confined, substantially as shown and described.

66,158.—CONFECTION.—E. C. Maltby and Edward Smith, Northford, Conn.

We claim a new and useful confection, composed of the meat of cocoanut prepared in the manner substantially as herein set forth.

66,159.—DITCHING MACHINE.—Chelton Matheny, Greensburg, Indiana.

1st, I claim in a ditching machine the revolving excavating wheel, D, armed with two circumferential cutters, J, J', and a series of radial knives, F, the latter being automatically advanced and retracted by the cams, H and I, as and for the purpose herein described and set forth.

2d, The inclined scraper, L, l, when used in combination with the wheel, D, knives, F, cams, H, I, and cutters, J, J', for the wheel of the excavated earth in the manner explained.

3d, I also claim the pair of revolving cutters or coulters, M, operating as described and for the purpose set forth, when used in combination with the aforesaid wheel, D, J, J', knives, F, and cams, H and I.

4th, In combination with the wheel, D, J, J', knives, F, and cams, H, I, I claim the shovel or scoop, N, for the object herein explained and set forth.

66,160.—SASH FASTENER.—W. W. Maughlin, Baltimore, Md.

I claim, first, the latch or lever, A, provided with the offset, c, arranged to work underneath the sash bead, and in such manner as to avoid the cutting away or defacing of the jamb or casing outside of said bead, substantially as described.

2d, The latch or lever, A, provided with the offset, c, and lugs or clamp a, a', arranged and operating as described.

66,161.—DAMPER FOR STEAM BOILER.—Henry McDonough, New York, N. Y.

I claim the valves, D and E, arranged and operating substantially as herein shown and described, in combination with a tubular steam boiler for the purposes specified.

I claim the valves, E, opened and closed by means of the weight, d, and chains, a, a', operated from the valve, D, by the rod, G, as herein set forth for the purpose specified.

I claim the partition plate, C', in combination with the valves for the purpose set forth.

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66,162.—WASHING MACHINE.—M. McEnerny, Birmingham, Conn.

I claim, first, the combination and arrangement of the vertically arranged plates or disks, E, E', fitting one within the other, one plate having a lateral adjustment, the other plate having a rotary motion, all substantially as herein shown and described.

2d, I also claim the hopper, h, in combination with the disk or plate, E', for inserting the clothes in the machine substantially as described.

3d, The soap device constructed as described, consisting of the projecting pocket, f, in the disc, E, cap, f', and set screw, g, in combination with the disc, E', as herein set forth forth for the purpose specified.

4th, The treadle device constructed as described and arranged to operate with the disks, E, E', and lever, F, as herein set forth for the purpose specified.

5th, I also claim the combination of the lever, F, with the disk or plate, E' substantially as and for the purpose described.

6th, The combination of the removable tub, K, with the disks, E, E', and the tub, A, substantially as and for the purpose herein shown and described.

66,163.—WHEELWRIGHTS' MACHINE.—Samuel Mills and J. R. McIrvin (assignor to James J. Robinson), Clinton, Ill.

I claim the stock, A, with the notch, c, adjustable arm, D, and graduated end, b, slide, B, provided with pin, a, and pointer, K, arm, G, and slotted plate, F, arranged to operate substantially as herein set forth for the purpose specified.

66,164.—SHEEP RACK.—John D. Munson, Tyre, N. Y.

I claim, 1st, The combination of the pivoted slat frames or racks, C and D, with the frames, A and B, substantially as herein shown and described and for the purposes set forth.

2d, The combination of the division boards or frames, E and F, with the frames, A and B, of the rack, substantially as herein shown and described and for the purpose set forth.

3d, The combination of the hinged boards, G I and H J, with the frames, A and B, and with the division boards or frames, E and F, substantially as herein shown and described and for the purpose set forth.

66,165.—WEIGHING APPARATUS.—J. W. Neal and W. H. Startzman, Big Lick, Va., assignors to themselves and Howard Munnikhuysen, Baltimore, Md., and said Startzman assignor to Neal & Munnikhuysen.

We claim the cam lever, A, cord, E, and weight, f, connected to the shaft, D, when used in combination with the beam, B, and belt, C, all the parts being arranged as specified.

66,166.—NEEDLE CASE.—John F. Newhall, Waltham, Mass.

I claim the needle case constructed as described, consisting of the slotted cylindrical case, B, in which the spindle, D, is pivoted, whose outer end is provided with the conical knob, E, the needle flannel, F, and strip, G, as herein set forth.

65,167.—WASHING MACHINE.—James M. Noble, Delhi, Iowa.

I claim, 1st, the construction of the beater box, B, containing the false bottom, D, over which the gravitating beater, F, slides, substantially as described for the purpose specified.

2nd, The combination and arrangement of the beater box, B, false bottom, D, beater, F, and double water receptacle, E, as herein set forth for the purpose specified.

66,168.—TOILET GLASS.—Albert Ober (assignor to himself John T. Ober, and Samuel F. Ober), Beverly, Mass.

I claim the two mirrors, H I, in combination with the series of folding frames, C D E F, and when necessary the supporting frame, G, hinged to the series of folding frames and attached to a box, A, or any suitable base, all arranged substantially as and for the purpose set forth.

66,169.—ATTACHMENT FOR SPADING FORKS AND SHOVELS.—H. W. Parsons and L. L. Wooster, Whitney's Point, N. Y.

We claim the loop, D, and the pin and collar, C, with the spade or fork, as and for the purpose specified.

66,170.—TRACK-RAISER FOR RAILWAYS.—Hudleson Patterson, Augusta, Mich.

I claim the arrangement of the pointed sliding shoe, F, upon the end of the screw, D, between the uprights, A A, having a curved base, C, and used for elevating railroad tracks in the manner as specified.

66,171.—GATE.—J. B. Powell and S. H. Everett, Macedon, N. Y.

I claim the combination of the pivoting rod, C, having a crank formed upon its upper part, and a pinion wheel, c', attached to its upper end, the toothed and pivoted plate, D, connecting rods, G, and operating levers, H, with each other, with the gate, A, and posts, B and F, substantially as herein shown and described and for the purpose set forth.

66,172.—MACHINE FOR MAKING BUTT HINGES.—Adrian Rais (assignor to Scovill Manufacturing Company), Waterbury, Conn.

I claim the combination of the single bending die, the clamping gage, the cams, the rock shafts and their arms, the pitman, the feeding apparatus, and the pushing slides, or the equivalents of them or either of them, the said combination being organized substantially as described.

66,173.—HANDLE ATTACHMENT FOR BLACKING BOXES.—Thomas S. Robinson, New York City.

I claim the handle, B, pivoted at C, to the bottom, a, or top, b, when constructed, arranged, and operating as herein set forth.

66,174.—HAND SAW.—Edward H. Roe, Jersey City, N. J.

I claim the application of a screw or its equivalent, to a back saw, substantially in the manner as and for the purpose set forth.

66,175.—SAD-IRON HANDLE.—Francis Joseph Schellmann, Syracuse, N. Y., assignor to himself and Theodore Thurber), Auburn, N. Y.

1st, I claim the shank, A, as constructed in combination with the spring catch, a, to hold the handle D, on, and allow it to be easily removed for heating, substantially as and for the purpose herein set forth.

2d, I claim the turned handle, D, spring catch, a, shield, E, and shank, C, as herein described, in combination with a flat or sad iron, substantially as set forth.

66,176.—MACHINE FOR UNHAIRING HIDES.—Judson Shultz, Ellenville, N. Y.

1st. I claim the combination of the apron or belt, E, wound upon or passing around the rollers, G and H, with the knife cylinder, B, substantially as herein shown and described and for the purpose set forth.

2d, The combination of the ratchet, I, pawl, J, pawl lever, K, and rack, L, with the journals of the apron or belt rollers, G and H, for the purpose of holding or tightening the belt or apron, F, and shifting its position, substantially as herein shown and described.

3d, Arranging the apron or belt, F, the knife cylinder, B, and feed rollers, D and E, with each other, substantially in the manner herein shown and described, so that the hides or leather may be fed to the knife cylinder, B, in which the said knife cylinder is moving.

4th, Arranging the gearing, N O P R, in the manner herein shown and described, so that the feed rollers, D and E, may be driven at a less velocity than the knife cylinder, B, as and for the purpose herein set forth.

66,177.—WRENCH.—John V. H. Secor (assignor to himself and James D. Secor), New York City.

I claim the sliding jaw, D, provided with the inclined or oblique opening, a, and having the spring, E, attached, and the screws, F, passing through the sides of the jaw into the grooves, f, in the sides of the shank, A, in combination with the racks, c e, in the rear and front sides of the shank, substantially as and for the purpose set forth.

66,178.—CHURN.—Henry Sidle, Minneapolis, Minn.

I claim the arrangement of the box A, provided with ribs on its inner side, dasher B, with its arms CC, as constructed, supports D D, with wheel F, and vertical handle H, for operating cog G, on end of dasher shaft, in the manner and for the purposes specified.

66,179.—STEP LADDER.—Henry T. Smith, Brooklyn, N. Y.

I claim the combination of the extension parts, G and J, and guide straps, H I K L, with the ordinary parts, A and B, of a step ladder, substantially in the manner herein shown and described and for the purpose set forth.

66,180.—SHEEP-FEEDING RACK.—Joel J. Smith, Barnesville, Ohio.

1st, I claim the pivoted bottom B B, in combination with a sheep rack, in manner substantially as and for the purposes described.

2d, The combination of the rack and adjustable troughs, in manner substantially as herein shown and described.

3d, The troughs C, adjustable by the bell cranks and lever arrangements in manner and operating substantially as above set forth and described.

4th, The pivoted shields H, in combination with troughs C, in manner and operating substantially as and for the purposes described.

66,181.—WASHING MACHINE.—L. Smith, Strongsville, Ohio.

1st, I claim the series of beaters B, as arranged in relation to the spring board G, rib H, and springs J, in combination with the inclined bottom, and operating conjointly, substantially as and for the purpose set forth.

2d, The elastic cushion Q, and block P, arranged in relation to the links D, and spring M, and crank, and applied as and for the purpose set forth.

66,182.—WIRE FENCE.—Lucien B. Smith, Kent, Ohio.

I claim the construction of a wire fence provided with rotary spools c c, having radial spurs, d d, and supported by cast-iron posts A, arranged as and for the purpose herein described.

66,183.—FRUIT AND POULTRY BOX.—Daniel B. Spinning, Brooklyn, N. Y.

1st, I claim the manner of connecting the cover to the back C', of the box by means of staples e e, and slotted plates g g, substantially as herein shown and described.

2d, A folding box, when made of the pieces A B B C C' D and E, all being hinged, connected, and fastened substantially in the manner herein shown and described.

66,184.—MACHINE FOR TRIMMING HEELS OF BOOTS AND SHOES.—Caleb S. Stearns (assignor to himself and W. E. C. Worcester), Marlboro, Mass.

I claim the revolving table F, with its swinging frames T, operated by mechanism substantially as described for traversing the heels to and from the knife, and for holding them in position while being trimmed, substantially as set forth.

I also claim the shafts E, with their gears D, revolved by the toothed portions b b', of the annular ring C, in combination with the pins s s', and their plates U V, or other suitable mechanism for producing the required revolution of the heels, substantially in the manner set forth.

I also claim the incline 10, for raising the plates U, which support the heels for the purpose of holding them firmly in position between said plates U, and yielding pressure plates V, substantially as set forth.

66,185.—MARKING ATTACHMENT FOR SEWING MACHINES.—R. H. St. John, Belfontaine, Ohio, assignor to J. W. Russell and D. S. Covert, New York City.

I claim the spindle E, having dog or foot piece K, marker H, spring M, screw J, holder B, and presser foot A, when constructed and arranged as herein set forth for the purpose specified.

66,186.—HORSE RAKE.—Jas. F. Swinnerton, Marion, Ohio.

I claim the combination of the plate or socket L, hook M, and ring N, with each other, and with the tongue K, and frame F G, substantially as herein shown and described and for the purpose set forth.

66,187.—EXTENSION SCAFFOLD.—C. M. Tanner, Mentor, Ohio.

1st, I claim the windlass A, guy ropes A' and A2, in combination with the platform H, operating substantially as and for the purpose specified.

2d, The swing braces, D1, hinged to and in combination with the main frame, as described, and operating as and for the purpose set forth.

66,188.—SEED AND GRAIN SIEVE.—H. S. Townsend, Greenvale, Ill.

I claim, 1st, Extending the screen, D, of a grain or seed separator or threshing machine, beyond the ordinary grain shoe, and supporting its outer end by an additional shoe, E, substantially as and for the purpose herein shown and described.

2d, The application of the wire braces, c c, below the netting of a wire screen, D, for the purposes set forth, and substantially as herein shown and described.

66,189.—WATER WHEEL.—Ebenezer Tuttle, Canaan, Maine.

I claim the regulator, C, and disk, D, arranged in relation to the gate, G, and wheel, A, substantially as and for the purpose set forth and described.

66,190.—FEED BAG.—John Vandercar (assignor to T. S. Sperry), Brooklyn, N. Y. Antedated June 20, 1867.

I claim the internal bag, E, extending downward and inward from the top of the structure, and provided with the spring, e, arranged to operate relatively to the internal bag, E, and to the perforated exterior casing, B, substantially as and for the purpose herein set forth.

66,191.—SIGNAL LAMP.—Joseph Wall, New York City.

I claim the box, A, having cases, B, fitted in it, provided with different colored glasses, a b c, and an opaque or dark section, d, and inclosing lamps or lights, the cases being placed before openings in the box, and all arranged substantially as and for the purpose specified.

I further claim the placing of the box, A, on a revolving stand, constructed and arranged substantially as and for the purpose set forth.

66,192.—MACHINE FOR FEEDING NAIL PLATES.—W. Wallick, (assignor to himself, S. F. Prince, and H. K. Smith), Philadelphia, Pa.

I claim, 1st, The nippers, L, constructed substantially as described, in combination with the devices herein set forth, or the equivalent to the same, whereby the reversing and reciprocating and vertical vibrating motion are imparted to the said nippers, as and for the purpose herein set forth.

2d, The said nippers, L, having the above specified movements in combination with a bed plate, F, by which the nippers are carried, and with the devices herein described, or their equivalents, by which the said bed plate and its nippers are advanced at uniform intervals for the purpose described.

3d, The recessed brackets, S S, or their equivalents, for holding the strips to be converted into nails, in combination with the sliding frame, T, and its shoulder and the mechanism described, or its equivalent, for operating the frame and causing the latter to move the lowest of the strips within the range of the nippers, as set forth.

4th, The nippers, constructed substantially as described and connected to the spindle, J, in combination with the cam-like plate, P, hung to the said spindle and operated by the moving bed plate through the mechanism described, or its equivalent, so that the said plate, P, may open the jaws of the nippers and permit the same to be self closed, in the manner and for the purpose specified.

5th, The segmental pulley, I, carried by the moving bed, F, and arranged to operate the spindle, J, through the medium of straps, q and q', or their equivalents, in combination with the vibrating plate, H, and its pointed projection.

66,193.—FLEXIBLE COUPLING.—N. W. Wheeler, Brooklyn, N. Y.

I claim, 1st, The combination of the coupling heads, B B, chock pieces, f f f, and clamp ring, D D, substantially as and for the purposes described.

2d, In combination with the above dividing and constructing the chock pieces, f f f and f2 f2 f2 f2, substantially as and for the purpose described.

66,194.—SURFACE CONDENSER.—N. W. Wheeler, Brooklyn, N. Y.

I claim the combination of the above described discharge nozzle with a surface condenser.

66,195.—WASHING MACHINE.—H. W. White, Olney, Ill.

I claim, 1st, The roller washing machine, B C D E, provided with attaching devices to secure it within a common wash tub, substantially as described.

2d, In connection with the above I further claim the pressure device, F G H J, in combination with the rolls, D, and frame, B B', as and for the purpose specified.

66,196.—PLANTING HOE.—Augustus Williams, Sebec, Me.

I claim a planting hoe composed of the parts herein shown and described when combined and arranged to operate substantially as and for the purposes set forth.

66,197.—SUPPORT FOR ELEVATED RAILWAYS.—F. A. Williams, Clovesville, N. Y.

I claim the construction of the posts, A, consisting of a combination of the bed plate, D, central post, C, side supports, E, and braces, F, with the sleeper, B, all made substantially as and for the purpose herein shown and described.

66,198—DOOR STOP AND LATCH.—C. L. Willis, Washington, D. C.

I claim the yielding stop as constructed in combination with a spring catch or hook, operating in the manner substantially as herein described for the purpose set forth.

66,199.—PILL MACHINE.—W. V. V. Wilson, Savannah, Geo. Antedated June 21, 1867.

I claim the adjustable rail, C, in combination with the board, A, and rubber, B, substantially as and for the purpose described.

66,200.—SULKY PLOW.—Israel Wing, Earlville, Iowa.

I claim, 1st, The combination of the inclined tongues, C, with each other, with the double tree, D, and axle, B, substantially in the manner herein shown and described and for the purpose set forth.

Second, The combination of the plow standards, G and H, bars, I, and chains, K, with each other and with the tongues, C, substantially in the manner herein shown and described and for the purpose set forth.

66,201.—PAVEMENT.—C. W. Stafford, Saybrook, Conn. Antedated March 27, 1867.

I claim, 1st, The constructing of sections of pavement composed of metallic bands grooved blocks of wood and keys, substantially as and for the purpose set forth and described.

Second, A pavement made up of sections of wooden blocks, substantially as described for the purpose specified.

66,202. — COTTON GIN. — Henry Scattergood, Albany N. Y.

1st, I claim a ginning cylinder formed with circular ribs or projections containing or supporting the teeth, said ribs or projections being elevated above the other portion of the surface of the ginning cylinder and thus leaving grooves for the reception of the guards, substantially as specified.

2d, I claim forming the ginning cylinder of a series of rings, between which, rings or segmeat of rings containing teeth are secured, substantially as specified.

3d, In combination with a cylinder carrying circular ranges of needle pointed teeth, I claim the guards, R, formed with openings to their upper ends, as and for the purposes specified.

4th, I claim attaching the delivering or doffing roller upon arms extending from the axis of the perforated condensing roller or cylinder so that said delivery roller is allowed to raise and accommodate the thickness of the bat and is kept properly in contact with the condensing cylinder as set forth.

5th, In combination with the condensing roller or rollers formed with smooth perforated surfaces, I claim the screen, V, and brush blower, B, for conveying the cotton to the condenser as specified.

REISSUES.

2 657.—SPIRIT METER.—Joshua G. Allen, Philadelphia, Pa.

Patented April 2, 1867.

1st, I claim a meter provided with a series of sample tubes or chambers, arranged to receive and retain samples of the liquid measured, substantially as and for the purpose set forth.

2d, I claim combining with a still two separate meters, so arranged that the high grade shall flow through one and the low grade through the other, independently of each other, as set forth.

3d, I claim constructing the meter, or such portions of it as may be necessary, of glass or other non-oxydizable material, to protect it from injury by acids.

4th, I claim the use of a graduated tube with a hydrometer placed therein, for the purpose of indicating the hight of the liquid, its quality or grade, and temperature, substantially as described.

2,658.—MOP WRINGER.—W. Gillett and W. S. Gillett, Stowe, Vt. Patented Nov. 13, 1866.

1st, We claim as a new article of manufacture a mop wringer composed of two plates hinged together substantially as described, for operation as set forth.

2d, In a mop wringer composed of two plates we claim making one of them stationary and connecting the other with it by a hinge joint or its equivalent, substantially as set forth.

3d, The combination with the stationary and movable plates, of side boards, or a frame to which the stationary plate is permanently secured, substantially as described.

4th, In combination with a mop wringer constructed for operation substantially as described, we claim the braces, or their mechanical equivalents, whereby the said wringer is or may be secured to a tub or other vessel.

5th, The comb nation with a mop wringer such as described of a foot board for steadying the tub while the wringer is being operated, said wringer and foot board being secured to the tub by braces, substantially as specified.

6th, In a mop wringer such as described we claim forming apertures in the plates for the ready expulsion from between the plates of the liquid expressed from the mop.

7th, In a mop wringer such as described we claim providing one of the plates with a handle to move it to and from the stationary plate, as and for the purposes set forth.

2,659.—MINCING KNIFE.—Helen M. Remington, Springfield, Mass. Patented Feb. 12, 1867.

I claim a hand mincing knife having a shank constructed solid or in sections, and terminating in the radial curved arms, b b, in combination with the blades, c c, so applied to the said arms, b b, as to leave and open central space, the whole constructed and arranged substantially as described and for the purpose herein set forth.

2,660.—HARVESTER.—Wm. N. Whitely, Jerome Fassler, and O. S. Kelly, Springfield, Ohio, assignees by mesne assignments of John Long. Patented Dec. 29, 1857.

1st, We claim the combination in a machine having two independent driving wheels of a single drag bar flexibly connected at its front end with the main frame forward of the axis of the supporting wheels, its rear end free to rise or fall independent of said main frame, and connected with the main shoe by two joints, one forward of and the other in rear of the sickle, for the purpose of affording the cutting apparatus firm support and permitting either end of the same to rise or fall with the undulations of the ground over which it is drawn, substantially as described.

2d, Connecting the main shoe of a cutting apparatus which has reciprocating cutters with a single drag bar flexibly conected with the main frame at its front end, and its rear end free to rise and fall with the undulations of the ground, independent of the main frame, by means of projecting joints, one forward of and one in rear of the sickle, so as to leave a clear space between said joints and beneath said drag bar, through which the cutters' connecting rod may be reciprocated, substantially as described.

3d, The combination of the following instrumentalities in a harvesting machine, viz., two independent driving and supporting wheels, a main frame which carries the gearing, a tongue which may be made rigid or flexible, a single drag bar flexibly connected at its front end with the main frame and its rear end free to rise or fall independent of said main frame, and a cutting apparatus which has reciprocating cutters and is flexibly connected to the rear end of said drag bar so that either end of said cutting apparatus may rise or fall with the undulations of the ground over which it is drawn, substantially as described.

4th, The combination in a harvesting machine which has two driving and supporting wheels and a cutting apparatus which has reciprocating cutters, of a single drag bar vibrating vertically upon a joint at its front end and flexibly connected at its rear end with said cutting apparatus, and a vertically slotted retaining link or plate to prevent any lateral movement of rear end of said drag bar and to limit its vibrations downward so as to support the weight of the cutting apparatus when folded upon the machine for transportation, substantially as set forth.

2,661.—HARVESTER.—Wm. N. Whitely, Jerome Fassler, and O. S. Kelly, Springfield, Ohio, assignees by mesne assignments of John Long. Patented Dec. 29, 1859. Division B.

1st, We claim the combination of the adjustable caster wheel, H', and outer shoe of the cutting apparatus when said wheel is directly connected with said shoe, substantially for the purpose set forth.

2d, The combination of the adjustable caster wheel, H', attached to the outer shoe, with the flexible track-clearing apparatus connected to said shoe inside of said caster wheel, substantially as shown and described.

3d, In combination with the flexible cutting apparatus, the two caster wheels, C' and H', arranged and supporting said cutting apparatus independent of the main frame, substantially as described.

4th, Supporting the heel of the drag bar by the caster wheel connected thereto, substantially as described.

5th, The combination in a harvesting machine which has two supporting wheels, a drag bar flexibly connected at its front end with the main frame and at its rear end jointed to a cutting apparatus which has cutters reciprocated in straight lines, and is free to rise or fall at either end with the undulations of the ground over which it is drawn, independent of the main frame, of an adjustable caster wheel to support the rear end of said main frame when the cutting apparatus is folded for transportation, and a tongue which may be made rigid or flexible, by which the machine may be drawn forward, substantially as set forth.

6th, Giving the cutter bar a reciprocating motion by two cam wheels, J and K, in combination with the reciprocating and rotating connecting rod, M, the whole being constructed and arranged in the manner and for the purpose set forth.

2,662.—PROCESS OF PREPARING HIDES AND OTHER ANIMAL TISSUES FOR THE MANUFACTURE OF VARIOUS ARTICLES.—New England Vulcanite Hide Company, Boston, Mass., assignees of Wm. H. Towers. Patented Aug. 21, 1866.

We claim the treatment substantially as described of animal tissue of any description, or its component elements, fibrine and albumen, or their modifications, gelatine, such animal tissues including raw hide and leather partially or wholly tanned, by combining the same with sulphur or any combination of or equivalent to sulphur, for the purpose of producing the the compound or the effects before described.

2,663.—STEAM DIGESTER FOR TREATING BONES, FISH, AND OTHER SUBSTANCES.—Wm. Perry, North Bridgewater, Mass. Patented Feb. 26, 1867.

I claim, 1st, A steam digester for treating bones, fish, bark, etc., which is made and operated substantially as herein shown and described.

2d, The combination of the suspended retort or digester, A, and the hinged steam caps, d d', on the charging and discharging openings, substantially arranged and employed as and for the purposes herein described.

3d, Also the stopper, m, and the diaphragm, n, in combination with the discharging cap, d', and the ejection pipe, p, arranged and operating substantially as and for the purposes specified.

4th, Also the steam-tight couplings, c and c', on the pipes, b and p, respectively, in combination with the suspended retort, A, for disconnection therewith, as and for the purposes herein described.

DESIGNS.

2,682 and 2,683.—PLATES OF A STOVE.—S. Colly and R. Scorer, Troy, N. Y. Two cases.

2,684.—VISITING CARD.—Samuel W. Francis, Newport, R. I.

2,685.—FOLDING CHAIR.—B. J. Harrison and J. Condie, New York City.

2,686.—PLATES OF A STOVE.—David Hathaway (assignor to to Fuller, Warren & Co.), Troy, N. Y.

2,687.—COOK STOVE.—J. Martino J. Beesley and J. Currie, Philadelphia, Pa., assignors to Marshbank and Martin), Lancaster, Pa.

2,688.—ENVELOPE.—Elisha Morgan, Springfield, Mass.

2,689.—PLATES OF A STOVE.—G. Smith and H. Brown (assignors to Abbott and Noble), Philadelphia, Pa. Antedated May 28, 1867.

EXTENSIONS.

SPIRIT LAMP.—A. J. Walker, New York City. Letters Patent No. 9,751, dated May 24, 1853.

I claim the employment of the plate, B, which serves as a protection against the fluid rising too high and becoming heated and exploding, and also as a support for the inner tubes, in combination with the spiral spring, E, and rod F, the rod serving to connect the said plate with the top of the lamp and the spring serving to hold the plate, B, firmly down on the flange, D, and also to throw up the cap and extinguishing tubes instantaneously after the top has been unscrewed, the whole being constructed, arranged and operating in the manner herein shown and described.

NUT MACHINE.—James Rees and Rob Crichton Exrs. H. Carter, Pittsburgh, Pa. Letters Patent No, 10,249. Dated Nov. 22d, 1853 Antedated June 3, 1853.

I claim the arrangement of the devices substantially as herein described for reducing the end of the blank bar to a given thickness preparatory to severing the blank, whereby nuts of uniform thickness produced from bars of irregular thickness, and the machine is protected against injurious strains.

PAPER FILE.—H. L. Smith, Gambier Ohio, formerly of Cleveland, assignors to H. L. Smith, Cleveland, Ohio, O. and L. Buttles and H. A. Swift, Revena, Ohio. Letters Patent No. 9,776. Dated June 7, 1853.

I claim the paper file herein described with prepared adhesion leaves or margins as a new article of manufacture.

MOP HEAD.—Harvey Murch, Lebanon, N. H. Letters Patent No. 9,781. Dated June 14, 1853.

I claim my improved mop head, composed of the fixed cross head, B, which has grooves in its lower side and in combination with the sliding binder, C, that terminates in a notched shank, c, and passes through the loop, a, on the handle, A, which serves as a detent in consequence of the action of the spring, d, on the underside of the said shank, substantially as herein set forth.

SAWS.—G. N. Reed and P. L. Tuttle, Geneva, N. Y. Administrators of J. H. Tuttle. Letters Patent No 9,807. Dated June 21, 1853.

I claim the combination, arrangement and location upon the same blade, of the setts of fleam teeth for scoring the sides of the kerf and the setts of planing teeth for removing the wood between the scores when said planing teeth are placed back to back curved in opposite directions, and are between the setts of fleam cutters, and at sufficient distance apart, so that each planing tooth shall serve alternately as a gage to its fellow, while allowing it to cut to a proper depth and be a permanent guide to the fleam cutters to prevent any of the teeth from taking two rank a hold upon the wood, which makes it run with great ease and efficiency, and is applicable to slitting or cross cutting, substantially as described.

Inventions Patented in England by Americans.

[Condensed from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

1,192.—MEANS FOR CHECKING AND GUIDING HORSES.—Wm. Clark, Valatie, and Wm. Griffin, Lansingburgh, N. Y. April 24, 1867.

1,265.—BOOTS AND HOES.—Geo. F. Chase, Boston, Mass. May 1, 1867.

1,269.—LOOM.—Erastus B. Bigelow, Boston, Mass. May 1, 1867.

1,285.—LOCOMOTIVE AND TRACTION ENGINE, ALSO RAISING HEAVY BODIES.—Theodore Krausch, Philadelphia, Pa. May 2, 1867.

1,287.—NUTMEG GRATER.—Henry J. Griswold, Boston, Mass. May 2, 1867.

1,299.—BREECH-LOADING REVOLVING FIRE-ARM.—Reuben Drew, Lowell, Mass. May 3, 1867.

1,301.—PORTABLE LAMP AND ILLUMINATOR.—Thomas Crossley, Bridgeport, Conn. May 3, 1867.

1,302.—FIRE ALARM.—Thomas Crossley, Bridgeport, Conn. May 3, 1867.

1,326.—LOCK.—James Brady, Norwich, Conn. May 6, 1867.

1,346.—MACHINE FOR SCOURING OR CLEANING GRAIN.—Peter T. Elting, Buffalo, N. Y. May 7, 1867.

1,358.—COTTON BALE TIE.—Geo. N. Beard, St. Louis, Mo. May 8, 1867.

1,378.—MODE OF LUBRICATING THE STUFFING BOXES OF STEAM ENGINES AND PUMPS, AND OF RENDERING THE PACKING WATERPROOF AND DURABLE.—Abraham Littlewood, Francis W. Bloodgood, and Henry D. Ostermoor, New York City. May 9, 1867.

1,390.—GOVERNOR FOR STEAM AND OTHER ENGINES.—Daniel F. Mossman, Cambridge, Mass. May 10, 1867.

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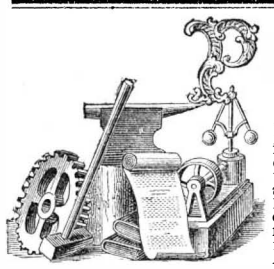

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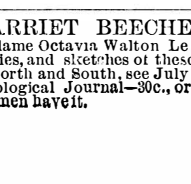

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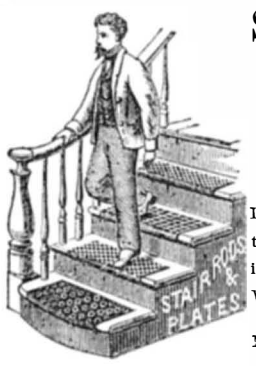

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MAIN SHAFTS:—Material, diameter, etc.; description of the main vertical shafts; description of the method of gearing the solitaire mills; method adopted to lessen the friction on the foot of the vertical shaft; present method by bevel wheels; transmission of power to machinery at obtuse angles by the universal joint; table of the length, diameter, etc., of couplings, coupling boxes, etc.

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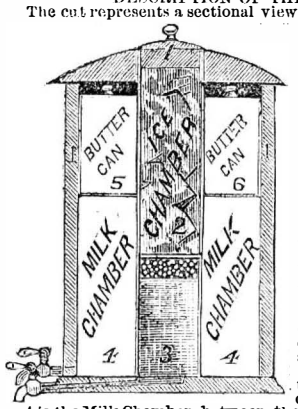
DESCRIPTION OF THE CAN.

The cut represents a sectional view of the can, showing the arrangements inside. The can is round, in shape and appearance like a water cooler, and can be made of any size required.



1 represents the outer rim, a double tin or galvanized iron case, filled with a non-conducting substance, to keep the cold in and the heat out.

2 is the Ice Chamber—a circular tube, fastened to the bottom and passing through the lid, with a separate lid to it.

3 is the Water Chamber, where the drippings of the ice are collected. The water is drawn from this chamber by a cock.

4 is the Milk Chamber, between the outer rim and central ice chamber; the milk is drawn by a separate cock.

5 and 6 are movable cans, made to fit closely around the ice chamber. These cans are to hold butter, berries, vegetables, or any article needed in a family. They can be taken out either separately or together, or left out entirely if required.

THE ADVANTAGES OF THIS CAN ARE:

First, Its economy in the use of ice. The ice being separated from the water, will last much longer than in an ordinary water cooler, and being in the center of the can, all its cooling properties are saved.

Second, Milk is kept sweet, unadulterated with water, nearly ice-cold, in the warmest weather, in the dining or living room, convenient of access. Buttermilk can be kept as well as sweet milk.

Third, The cans in the upper part of the milk chamber will keep any article used in a family without additional cost for ice.

Fourth, The water filtered from the ice will furnish the family with ice water.

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The attention of Manufacturers and Dealers is called to this valuable invention. There will be no limit to its sale when its advantages are known.

The can was exhibited last fall at the Indiana State Fair, at Indianapolis, and the Illinois State Fair, at Chicago, in both of which it received the first premium, and the commendation of all that examined it.

For a description of this cooler see Scientific American, April 27, 1867, page 276.

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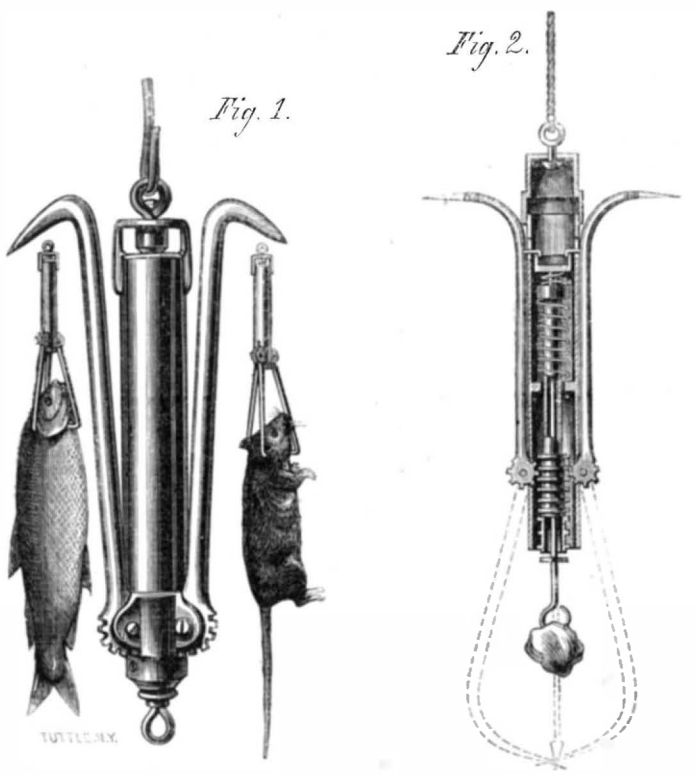
KING'S SPRING FISHHOOK AND TRAP.

The engravings give a correct idea of an improved spring trap patented through the Scientific American Patent Agency, by Jacob King, Jr., of Fort Wayne, Ind., Nov. 20, 1866. Fig. 1 shows the external appearance of the instrument, as set—large figure—and as sprung in the smaller figures. A section exhibiting the interior mechanism is seen in Fig. 2. The outside is a tube having a swivel hook at its upper end, and near the lower projections or ears to receive three hooks. The pivoted ends of the hooks are formed into pinions or segments of gears which engage with a rack cut on the exterior of an inner tube contained inside the outer case. Encircling a portion of this inner tube is a spiral spring one end of which bears against a collar on the end of the tube and the lower end on a projection on the interior of the case. This spring has sufficient tension to spring the hooks down with great force when allowed to stretch after being compressed. Inside the tube is a rod or wire having a hook or ring at its lower end for the reception of the bait, and a hollow disk at the upper end which is held up to position by means of a light spiral spring between the bottom of the disk and the collar on the tube as seen in Fig. 2.

To set the trap the hooks are elevated and a catch on one or more of them passes through the outer case—small apertures being left for that purpose—and engages with the projecting rim of the disk on the bait rod. A very slight pull or movement of the bait overcomes the limited resistance of the small spring, depresses the disk, disengages the hooks, and allows the larger spring to act.



IMPROVED FISHHOOK AND TRAP.

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A large share of our time as patent solicitors is consumed in writing excuses for grievances occasioned by the incompetence and mismanagement of the Commissioner. In the name of thousands of suffering inventors we appeal to Congress for a speedy correction of the Patent Office abuses. Let a committee of investigation be appointed, witnesses sworn, and all its mismanagement exposed.

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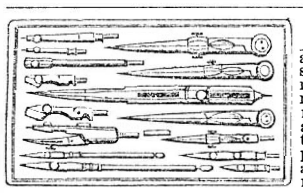

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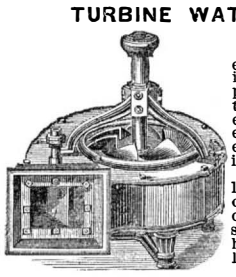

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